HT, JUNE 11, 1936

FIRST AERO WEEKLY IN THE WORLD

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JUN 24 1936

FLIGHT

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1433
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The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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Australia Agrees

IT is welcome news that the Commonwealth Government has agreed to the scheme for one trunk line by flying boat right through to Sydney. The Australian preference for "breaking the gauge" at Darwin and using landplanes from there across Queensland and New South Wales was intelligible, and *Flight* has given publicity to the Australian side of the question. But when all is said and done, the best thing all round is to have one uniform method, not only as far as Australia, but on to New Zealand in good time, and then perhaps even farther afield. Such uniformity means economy of operation, from which Australia as well as New Zealand will benefit in the long run.

One instance of saving money by flying round the coast is that transport of petrol by steamer to the ports *en route* is much cheaper than establishing fuelling points inland. More important is the economy effected by sending Imperial Airways flying boats right through to the end of the line, while the boats of Qantas Empire Airways will likewise go right through to Portsmouth. The subsidy arrangements, we may feel sure, have been settled to the satisfaction of both parties. The Home Government has been very generous in its dealings with India regarding the subsidy over that part of the route, and the same attitude has doubtless been taken up towards Australia. In fact, in many such negotiations the danger has been that the Home taxpayer may be asked to bear too large a share of the burden, and the taxes in Great Britain are woefully heavy.

The Queensland Service

There is, we understand, no danger that the inland service of the old Qantas company will be discontinued by this arrangement, but that is naturally a domestic concern of Australia. The local air travellers will actually benefit by the diversion of the trunk route to the coast. Of late, local applications for seats have sometimes had to be refused because the machines were full up with through passengers. The recent duplication of the service brought some relief to Queensland travellers, but the new arrangement will finally remove all ground for complaint on that score.

Australia has agreed to send the half-ounce letter through to England for 1½d., though presumably the air mail surcharge for a letter carried inside Australia will continue to be much higher. This will remain an anomaly until the inland air surcharge can be reduced. At present the inland letter writers will be no worse off than they were before, while those who send letters to England or any other British land on the route will be much better off. There should be no cause for grumbling in that. Nobody will be worse off than he is at present. This cheap flat rate for British Empire mails is such a great conception that it rightly outweighs all minor considerations.

London's Airports

EVERYBODY knows the old story about the country cousin who asked a London policeman "the way to the railway station," and was very surprised to be told that there was more than one. The same story might now apply to London's airports. The number is steadily increasing, and on Saturday the Air Minister formally added Gatwick to the list. Before very long we may expect another addition at Fairlop, near Ilford, in Essex; while Gravesend is being steadily developed along modern lines.

The novel layout of Gatwick, which was fully described in last week's issue of *Flight*, was the most interesting thing which Airports, Ltd., and British Airways, Ltd., had to show to the very large party of guests which they entertained on Saturday. The art of dealing quickly with air traffic when it is on the ground is being gradually evolved, and Gatwick is an excellent example of the latest theories on the subject, theories which are based on experience gained elsewhere. Of almost equal interest were Lord Swinton's remarks

on the ideal location of a London airport. He stamped heavily on the idea, often put forward by "unintelligent people," that there might some day be an airport in central London. He did not even mention the suggestions so often made in recent years of an aerodrome on top of a railway station or on a platform connecting two bridges over the Thames. There was only one possible aerodrome in London, he said, namely Hyde Park, and he poured scorn on the possibility that people might ever become so unæsthetic as to tolerate the cutting down of all the trees to make the park into an airport. His final decisive "It will not come" may be taken as putting an end to that unprofitable discussion.

Cost and Fog

It may, however, comfort the said "unintelligent people" to know that the committee which reported to the City of London on the Fairlop site did make careful enquiries into the possibilities of a roof or bridge aerodrome, and also into the chances of using autogiros for getting to central London. The cost of the roof and bridge schemes they found to be prohibitive, while they were advised that the autogiro was not yet sufficiently developed to offer a solution. Obviously, if an autogiro is to lift a very heavy load, it must have a large wing area, and the span of the rotors would then become so great as to introduce new problems. The autogiro will doubtless solve other difficulties, but not this one.

Even if the schemes for a central London airport were more promising than they are, such an airport would not get rid of the problem of London fogs, and pilots cannot yet be provided with infra-red spectacles. One of the chief merits of Gatwick, and also of Gravesend, is that both these aerodromes lie outside that fog belt. Local fogs they may have to endure at times, but the London fog is the worst thing of its kind, and it has not yet been mastered by science. The ideal is to have airports outside that belt and to provide very quick transport between them and central London. Croydon depends on road transport; Gatwick on the Southern Railway. Lord Swinton reminded his audience that trains are not subject to the 30 m.p.h. control, and they are, in fact, the fastest means of ground transport. It is a good thing to see co-operation between a great railway and an airport; and doubtless the present hopeful beginnings will be developed into something much more elaborate as air transport increases in importance and in volume of traffic. To cut down the time spent on ground transport is now the best way of shortening the travel time of aeroplane journeys to the neighbouring parts of the Continent.

THE WATCH FROM ABOVE: Four Hawker Osprey IV fleet fighter reconnaissance seaplanes with 600/640 h.p. fully supercharged Kestrel V engines over Alexandria Harbour. Machines of this type are carried by a number of warships of the Mediteranean fleet; with wheel undercarriages they are operated in large numbers from aircraft carriers.

The Outlook

A Running Commentary on Air Topics

The Johannesburg Race

WITH a possibility of winning some £7,000 it is to be expected that a large number of aeroplanes will be entered for the London-Johannesburg race which is due to start from London on September 15 A very great deal will depend upon the details of the regulations. Suitably framed, they may produce a splendid list of entries; indifferent regulations may reduce the list to very small proportions.

Accepting the statement which has been made, that the largest prize, of £4,000, is to go to the machine making the fastest time, it is possible, theoretically, to select right away a few machines as likely winners. There will be no time to design new aeroplanes after the regulations have been announced, and the most that can be hoped for is that some types which have been designed, but construction of which has been shelved owing to pressure of other work, may be rushed through in time for the race. That, however, is likely to be an isolated case.

Probably the fastest type possibly eligible for the race is the Bristol 142. This machine was built originally as a commercial aeroplane but was afterwards fitted with more powerful engines and purchased by Lord Rothermere, who presented it to the R.A.F., and it now carries the service "rings." It is, perhaps, doubtful that the machine would be accepted as a civil type for the race, even if the R.A.F. were willing to release it. Should it be a starter, however, it will almost certainly be the winner, barring accidents. The De Havilland Comet is probably the second favourite.

Next in speed come such types as the Airspeed Envoy, the Blackburn H.S.T.10, which should be finished in good time for the race, the Monospar Croydon and the Avro 652. All these types have top speeds in the neighbourhood of 200 m.p.h. and their performances are sufficiently close together to produce a keen race over such a long course, on which good navigation may well make up for a slight deficiency in speed as compared with a faster machine slightly less well navigated.

The handicap race is so much influenced by handicap allowances and possible effects of commercial feature allowances that it would be idle to speculate on the chances of any particular type..

Without Subsidy?

THE final judgment on the central London airport idea was not the only interesting feature of Lord Swinton's speech at Gatwick. The taxpayer, he said, would go on backing civil flying so long as he was sure that the money was spent on plans the ultimate object of which was to make air transport pay its own way. The time when that would come about might, he said, be nearer than some people thought.

That is almost a prophecy, and, as the saying is, it gives one furiously to think. The Air Ministry has just persuaded the House of Commons to give it authority to pay increased subsidies to Imperial Airways and other air companies. The need for this increase has been generally conceded.

None the less, in certain circumstances air transport can be made to pay on its own merits. One may feel certain that the shareholders of Railway Air Services are not exactly anxious to lose money, and they have just announced a new and greatly expanded programme for this summer. One-fifth of the shares in R.A.S. are held by Imperial Airways, which receives subsidies in respect of some, but not all, of its services. The rest are held by the four great railway companies, which are not subsidised concerns. In fact, the amount of public money which reaches the operations of R.A.S. is very diluted.

There is, however, a painful moral to be drawn from the history of certain British shipping companies. Subsidised foreign lines have obliged them to appeal to the British Government to help them. If British air transport ever comes to "fly by itself," can we be sure that foreign nations will not continue to subsidise their national lines, and so force Great Britain, willy-nilly, to follow suit?

Union is Economy

YET another point in Lord Swinton's Gatwick speech is worthy of comment. He made a strenuous *apologia* for the grouping together of civil and Service flying under one Ministry. *Flight* has more than once pointed out that this arrangement does not mean the subordination of civil to R.A.F. interests. The Director-General of Civil Aviation is in a very independent position, and the Air Members of the Air Council have no power, even if they had the inclination, to interfere with him. Lord Swinton, however, did not content himself with showing that there are no vices in the system. He claimed absolute merits for it, in particular the great merit of economy in administration.

Aeronautical progress now depends on research more than on anything else, and research is sometimes very expensive. The Air Minister mentioned one case in which both the civil side and the R.A.F. side of the Air Ministry were clamouring for expensive research programmes to be undertaken. He called the heads of both together, and a programme was drawn up which satisfied the requirements of both and saved the country several thousand pounds. The moral is that the present arrangement is a good one.

West African Possibilities

NOW that Air France is carrying passengers over part of its mail run to South America, it might be a particularly apt moment to ask why we, with our West African possessions, have not yet considered it desirable to operate a service over this route—carried, of course, a few stages farther.

Imperial Airways have already reached Kano from the main trunk route, and in due course Elders Colonial Airways will take over the balance of the service to the Gold Coast. For the inhabitants of Sierra Leone, Ashanti and even Nigeria, however, this roundabout route would hardly appear to be economical either in time or money.

During the past two years, and even within recent weeks, there have been both statements and rumours concerning West African services, Cape services down the west coast of Africa, and South Atlantic services. If properly and effectively run, such services would merit official financial support—and obviously they could not hope to be an immediately economic proposition unless they received a subsidy.

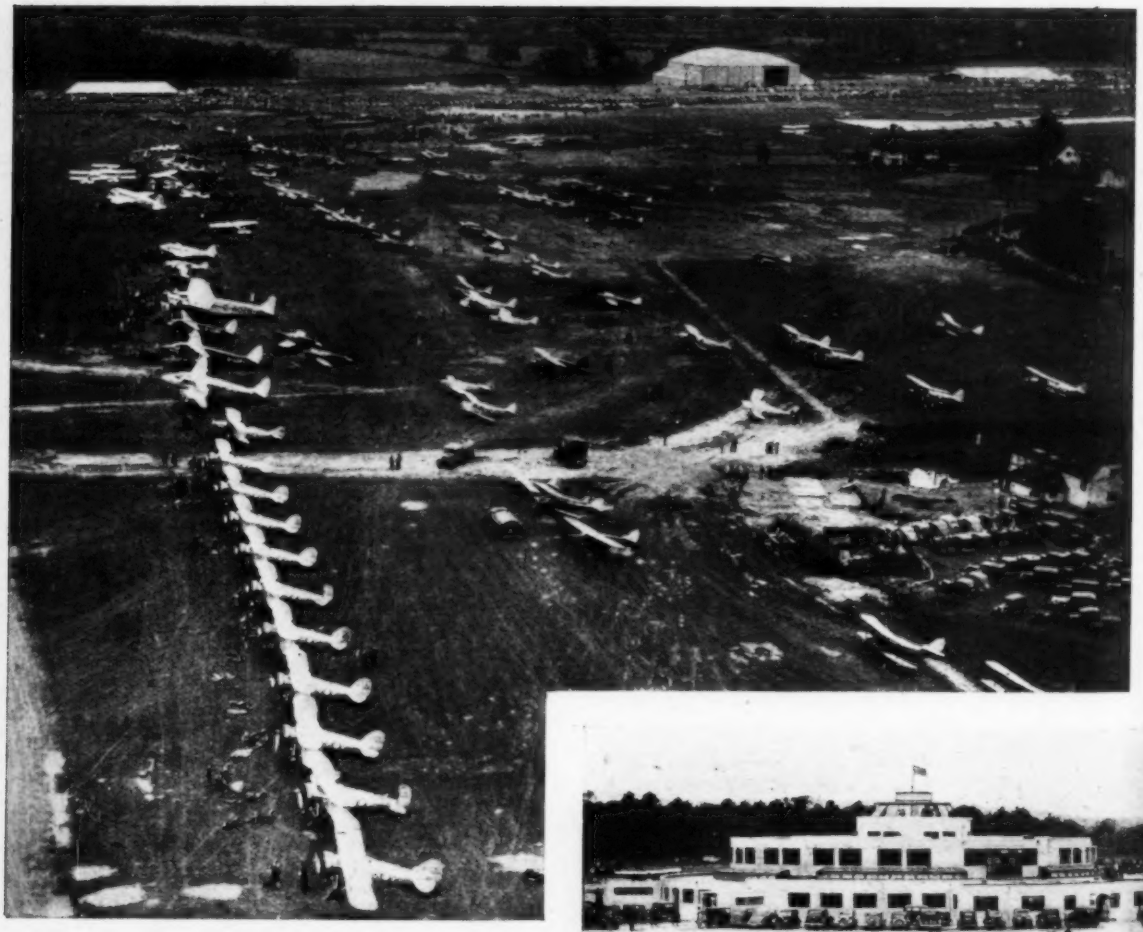
There is little doubt, however, that, if more than one company is, in fact, considering the idea, the Government will, in its own interests, demand that there should be co-operation, or even an amalgamation of interests, before making any offer of assistance.

GATWICK'S

London's Latest Airport Opened by ... Invaded from the Air

"WE used to have Martello towers on the south coast to repel invaders. It has been left to the practical genius of Mr. Jackaman to create a new Martello tower whose object is to attract as many Continental invasions as possible."

Thus, neatly, did Lord Swinton, the Air Minister, sum up its outstanding feature when he opened South London's new airport at



An aerial impression of some of the many aircraft, civil and military, which attended the Gatwick opening. On the right is a panorama, from the S.R. station roof, showing cars and people round the "Martello Tower." The *Flight* photograph at the top of the page shows Lord Swinton declaring the airport open; on the left of the picture is Lord Goschen, chairman of Airports, Ltd., and beyond him Sir Francis Shelmerdine, Director-General of Civil Aviation.

SEND-OFF

Lord Swinton : "Martello Tower" Road and Railway

Gatwick last Saturday. We shall not dwell here on this and the other striking features of the airport—they were fully described in last week's issue of *Flight*—except to say that the layout and the general spaciousness of the aerodrome, runways and buildings obviously surprised and pleased those among the official guests who had not made its previous acquaintance. These guests, invited by British Airways, Ltd., and Airports, Ltd., included a number of high officials of the Air Ministry and Air Council, foreign air attachés, and almost everyone of note in the aeronautical world. But this invasion—the main body of which arrived by a special train from Victoria, thus enabling the passengers to obtain a first-hand impression of the modernistic communicating tunnel between the station and the Martello Tower—was as naught compared with the onslaught of the general public, probably 90 per cent. of whom had come primarily to see Mr. Clem Sohn's "experiments in bird-like flight" (*vide* Press), yet who were obviously captured by the romance attaching to this very modern airport, and to the 170-odd aircraft which had congregated there for the occasion. Theoretically, the majority of the crowd was confined in a one-and-two enclosure; in practice, it wandered everywhere, among the machines and in the airport buildings, and enjoyed itself immensely.

The enclosures were decorated with the flags of all nations whose countries are linked to our own by the routes of British Airways Ltd. In the air is Mr. Kronfeld's Drone.

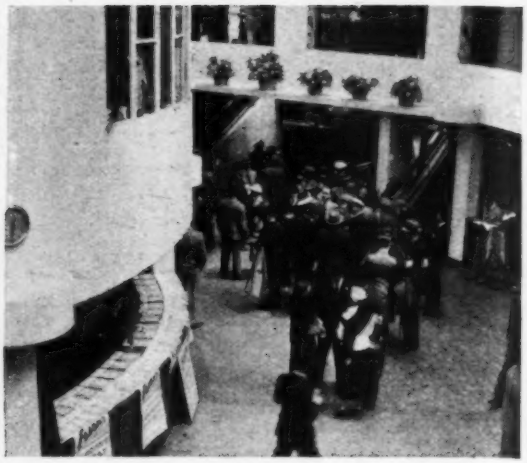
Probably never before has there been such a varied collection of aeroplanes, both in type and size, at any flying event in this country. There were civil and military types, ranging from a *Pou-du-Ciel* to D.H. 86s, a Vildebeest and the Monospar S.T.18. A dozen clubs contributed their quota, and an arrival competition added to the fun, so that at one time the sky very nearly approached the state, beloved of the journalist, of being "darkened" by aeroplanes. Actually, during the arrival competition exactly a hundred machines clocked-in between 12.4 and 12.30. Air Marshal Sir John Higgins, who acted as judge, gave a sealed time to Mr. Rowarth, who was checking-in the arrivals. Mr. R. E. L. Beere (Puss Moth) touched down nearest to the sealed time, and received the Gatwick Cup and £15, while Mr. Dade (Gipsy Moth) and Mr. Frogley (Monospar), from Broxbourne, were runners-up.

The control officers must have had their hands pretty full, but all went well, and, with the exception of a Moth which had apparently found a large horse's hoofprint in a patch of still-virgin clay and accordingly stood on its nose, there were no incidents.

Lord Swinton arrived from York by air in a Hart of No. 24 (Communications) Squadron. He was received by Viscount Goschen (chairman of Airports, Ltd.) and his fellow directors, the directors of British Airways, Ltd., and the Southern Railway, together with Sir Francis Shelmerdine, Director-General of Civil Aviation.

After inspecting the buildings, Lord Swinton and his hosts adjourned to the private owners' hangar for the official luncheon. Speeches were occasionally drowned by the Southern Railway electric trains, which led one speaker to remark that this co-operation between rail and air had its drawbacks.

Lord Swinton, in replying to the toast of "The Air Minister" (proposed by Lord Goschen), said that from time to time rather unintelligent people asked him when an



(Left) A glimpse of the Miles Whitney Straight under the rotor blades of the C.30 Autogiro. (Right) Visitors inspecting the circular traffic hall in the main building. (*Flight* photographs.)

airport was going to be established in the middle of London. The answer, he said, was "when everyone is so air-minded and unæsthetic that every tree in Hyde Park can be cut down."

Gatwick, he went on to explain, was one of the alternatives to a central London airport, and, with the co-operation of the Southern Railway, everything had been so well arranged that the air passenger would hardly know when he had left the Ritz and when he had arrived at the Meurice.

Between 1934 and 1935 air traffic to and from London had doubled, and he looked forward with confidence to Gatwick's future as an airport.

Dealing with the aims of the Government with regard to civil aviation, Lord Swinton said that the partnership of civil and military aviation in the Air Ministry was both sound and inevitable. Scientific research in both branches went hand-in-hand, and experiments that were of benefit in one were very often equally applicable to the other. "I promise you this," said Lord Swinton, "I will always find time for civil aviation."

Mr. W. D. L. Roberts (chairman of British Airways) proposed "The Visitors," and Mr. R. Holland Martin (chairman of the Southern Railway) replied.

The Opening Ceremony

After lunch the party moved across to the dais on the edge of the landing area, and Lord Swinton, in another brief speech, declared the airport open. Simultaneously, Flt. Lt. Gerald Hill descended by G.Q. parachute from a B.A. Swallow flown by Mr. D. M. Bay, and, coming across to the dais, presented a message of greeting to the Air Minister.

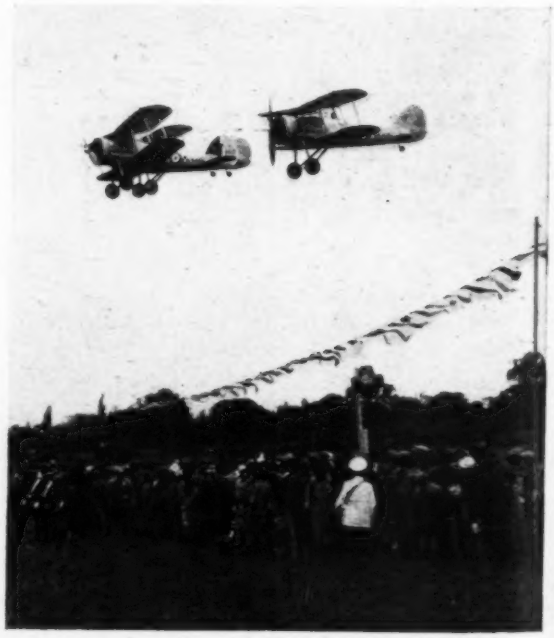
Though demonstrations of the same aircraft by the same pilots become a little wearisome to those who have to watch them week-end after week-end, everything was new to the majority of the Gatwick public, and Mr. William Courtenay's excellent microphone commentary made the whole thing comprehensible to them. As general organiser of the whole affair, Mr. Courtenay appeared to be doing the work of about six people in the intervals between announcements.

Capt. "Jimmy" Jeffs, O/C flying, had his work cut out to get things going after a start delayed by the official ceremonies over-running their time-table, but by skilful rearrangement of items he soon caught up with schedule. As cheerfully imperturbable as ever, he quietly fished the correct aeroplanes out of the sea of humanity and sent them into the air according to programme.

Mr. Brie led off with his usual brilliant exposition of the qualities of the C.30 Autogiro, ending with a dead-stick near-vertical descent, and the B.A. Eagle (Mr. John Rogers) and Swallow followed, Flt. Lt. Gerald Hill giving a particularly entertaining crazy-flying display on the latter machine. To quote the programme's neat comment, he demonstrated its ability to assume droll and alarming attitudes, bordering on the incoherent, at all speeds without loss of control.

Mr. R. F. Hall, in the Hillson Praga, showed the public what manner of machine it was that had flown from London to Capetown on a fuel consumption of 30 m.p.g., while Mr. Kronfeld, in the Drone, and Mr. Geoffrey Hall, in the Tipsy monoplane, in the air together, showed two contrasted methods of attaching aerofoils to a Douglas flat-twin engine. F/O. John Kirwan, with the Aeronca, completed the light brigade.

Capt. Percival put the Vega Gull through its paces, and



The three Gloster Gauntlets of No. 19 Squadron, which put up a magnificent tied-together display.

F/O. J. H. Hill gave a very dashing show in a Blackburn B.2 trainer, his long full-throttle dives and wide-radius loops suggesting a fighter rather than a light training type.

Flt. Lt. Tommy Rose, in the Cape Town Falcon, put up a characteristic aerobatic exhibition, every manœuvre perfectly timed and executed. At the same time, and at lower altitude, Mr. F. G. Miles performed with the Miles Whitney Straight, doing some very convincing flaps-down loitering.

The Monospar S.T.18, or Croydon, handled by Flt. Lt. Schofield, gave its usual impressive exhibition, the spectacle of a "giant air liner," with its feet tucked up, going past at 210 m.p.h. and 100 ft. being definitely uplifting. One was also led to conjecture which would have won in a noise competition—the S.T.18 or British Airways' F.12 Fokker, which, in company with one of their D.H.86s and a Rapide, was engaged on joy-ride duties.

The High Spot

But it was left to the Gloster Gauntlets of No. 19 Squadron from Duxford to provide the real high spot of the display. Their flight aerobatics have been seen in public more than once, but the performance is so pluperfect that it can never pall. From the moment the three Gauntlets, tied together by short, beflagged cords, first come whining earthward from 3,000 ft. or so until they mutter in to land, cords still intact, their show is sheer joy to watch. The finest manœuvre of all is the upward flight roll, the three machines rolling as one about the axis of the leader as they rocket almost vertically skyward. With equal facility they half-roll off the top of a loop, wing-tips never more than three or four feet apart. The whole thing is a superb exhibition of interaction between mind and matter.

By contrast, yet equally admiration-compelling in a different way, came Mr. Clem Sohn's descent from an Air Commerce Dragon. A solid canopy of cloud prevented him descending from his usual 10,000 ft., and he had to depart from the Dragon as it flitted through the lower layers at 5,000 ft. or so. His drop far more nearly approached a controlled flight than when we first saw him at Hanworth, and one realised the difference in his falling speed as soon as he shut his wings preparatory to opening his parachute, which somewhat vital process he delayed until he was within about 700 feet of the ground. Then the parachute appeared to catch in his gear as it opened, and he released his emergency 'chute, with only 200 ft. or so to spare. Hampered by the folds of the entangled canopy, he became involved with his wings as he touched down, unfortunately breaking an arm. All of which seems to suggest that he has some way to go before he can meet the feathered world on level terms.

Incidentally, Mr. Sohn was not the only casualty; the flight leader of the Gauntlets, at the end of their show, put him arm up to signal to his companions, and promptly had it dislocated by the slipstream.

To round off the flying programme, Flt. Lt. Colman demonstrated the Scorpio-engined Envoy, and Mr. Hordern gave a charming exhibition of the quiet Heston Phœnix.

Finally, Bell's Asbestos Company, Ltd., gave their fire-rescue demonstration, in which a gentleman in an asbestos suit sits with complete composure in a merrily burning aeroplane, and two others, similarly attired, "rescue" him after a suitably long period has been allowed to elapse. Mr. Noel-Brown, who came to complete the gruesome drama with the Monospar ambulance, told us that the "victim's" suit was so hot that they were unable to load him on the stretcher with bare hands.

While acknowledging the spectacular appeal of these demonstrations, and also their value in demonstrating that fire does not mean *finis* for the occupants of an aeroplane when such equipment is at hand, one wonders whether it is really a good thing to remind the public too often that crashed aeroplanes burn so nicely.

Be that as it may, the crowd enjoyed it, just as they had obviously enjoyed the rest of the show, and the urge to go joy-riding in British Airways' fleet was very manifest during the remainder of the evening.

HENDON, 1936

IT is the custom not to issue the complete programme of the R.A.F. Display—to be held this year at Hendon on June 27—until a few days before the event. The various rehearsals, however, offer some indication of what may be expected.

Judging from that staged at Hendon on Monday, it is the same, but nevertheless entertaining, old story of aerobatics, low attack, gunnery training and aerial skittles. But that is not all. The set piece (hear ye, oh lovers of noisy, smoky, destruction) is being revived and takes the form of an extremely sturdily-built and super-detailed factory, complete with massive smoke-blackened chimneys.

The new and experimental types park should be the most interesting for years. Several new fighters and bombers, including, in all probability, the Hawker and Supermarine monoplanes with speeds in excess of 300 m.p.h., the Fairey Battle and A. W. Whitley, will be there. Hitherto the fastest machines flown at any Display have been the Hawker Super Fury and Gloster Gladiator, both capable of rather more than 250 m.p.h.

For sheer excitement the low attack remains unchallenged. It appears that No. 32 (F) Squadron has specialised in ground strafing, for this unit is demonstrating again this year, and presents one of the most brilliant examples of co-ordinated flying ever seen at any display.

The Overstrand in its combat with a flight of Furies seems to become more agile with age. Never has it or its precursor, the Sidestrand, looped and stall-turned so frequently and effectively.

A novelty will be an exhibition of obsolete aircraft which will enable everyone to see at a glance just how great has been the advance in design in late years.

British Aircraft Exports Record

DURING 1935 British exports of aircraft reached a total of £2,721,441, the highest on record. This amount exceeded the 1934 total by £800,339.

Of the 1935 total, £1,137,036 worth of aircraft and components went to European countries; £1,001,661 to British possessions overseas; £161,308 to the U.S.A., Central, and South America; £357,419 to the Near East; and £64,017 to the Far East.

Forthcoming Events

June 13-14. Opening of Brighton, Hove and Worthing Airport: International Rally.
June 13-19. Hungarian Pilots Pic-Nic.
June 27. Royal Air Force Display, Hendon.
July 2-5. Belgian Aviation Clubs: Tour Aerien Belgique.
July 10 and 11. R.Ae.C.: King's Cup Race.
July 18. Portsmouth Aero Club: Isle of Wight Race.
July 23-26. R.Ae.C. Week-end Aerien.
August 1. Cinque Ports Club: Folkestone Trophy Race.
August 1-3. Yorkshire Gliding Club: Open Meeting.
August 2-15. Yorkshire Gliding Club: Instruction Camp.
August 3. Ramsgate Airport: *Pou-du-Ciel* Race.
August 8. Reading Aero Club: Northesk Cup Competition for Women Pilots.
August 15-30. Yorkshire Gliding Club Open Meeting and Competitions.
August 22. Midland Aero Club: "At Home" and Contact Air Race.
August 29-30. Cinque Ports Club: International Rally and Wakefield Cup Race.
August 29-Sept. 6. British Gliding Association: Annual Competition, Gt. Hucklow, Derbyshire.
August 30. Gordon Bennett Balloon Race, Poland.
September 5-6. Aero Club of Hungary: Week-end Aerien.
September 12. London Aeroplane Club: Hatfield Garden Party.
September 13. Aero Club de France: Coupe Deutsch Race.
September 15. London-Johannesburg Race.
September 20. London Air Park Club: Display.
October 25. Aero Club de France: Saigon Race.
November 13-29. International Aero Exhibition, Paris.

THE NAVY that FLIES

A Discussion of some Topical Subjects Affecting the Fleet Air Arm : Bombs v. Battleships : Carriers, Catapults or Flying Boats?

"AN adequate equipment of ship-borne aircraft is as necessary to a Fleet as are modern guns and efficient armour plate." . . . "Air spotting, at one time regarded as somewhat of a luxury, has now become a vital necessity."

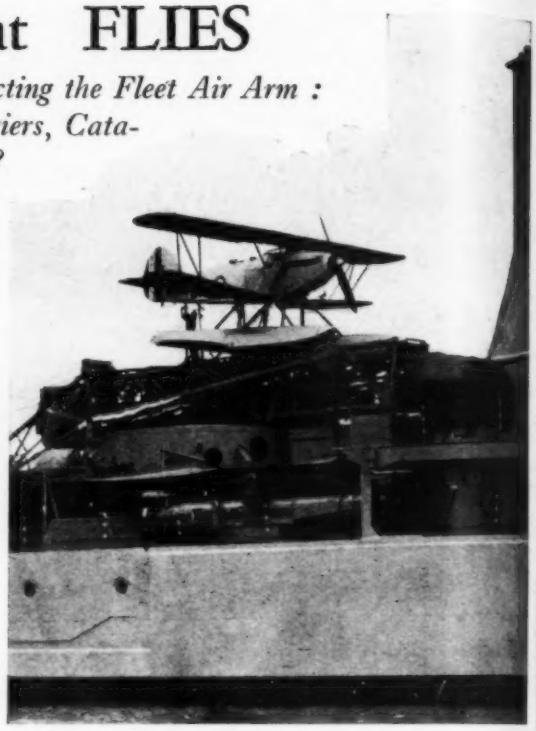
The above quotations from the Naval Air Section of *Brassey's Naval Annual*, 1936,* should be a complete answer to those who imagine that the Royal Navy is not whole-heartedly interested in its Air Arm.

The public and the non-specialist Press have lately shown not a little interest in one question, namely, can an air bomber sink a battleship, and is the battleship (or rather the capital ship) therefore an expensive anachronism? When a First Lord of the Admiralty states in Parliament that the capital ship is not obsolete, some critics are prone to comment that that is merely naval conservatism. Various writers in *Brassey* give reasons for their opinions on this subject. Before considering them, it may be recalled that only the other day one of the experts who had been engaged on the secret tests said publicly that if he had to choose whether to embark in a warship which was to be bombed or one which was to be shelled, he would choose the former. He would feel much safer in it.

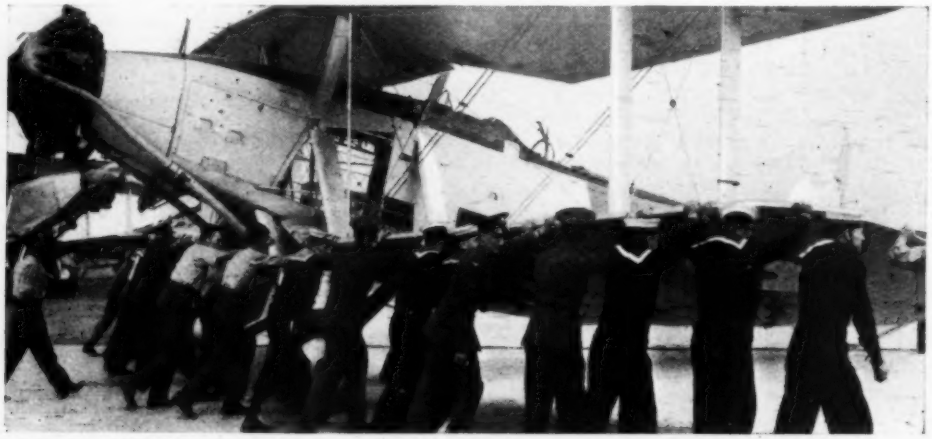
Aircraft in Attack

When the torpedo was first invented there were those who said that the battleship was doomed. Actually, the torpedo led to modifications in the design of capital ships, but the battleship continued to rule the seas. Aircraft will also probably lead to modifications in the design of ships, but so far from rendering ships obsolete, they have already extended their powers and their usefulness. There are three forms of attack by aircraft on ships, and they are all analysed by the writers in this volume. They are by (1) torpedo, (2) level bombing, and (3) dive bombing. Of these three the torpedo seems to cause the greatest anxiety. It will be more effective against the capital ship than against the faster and more manœuvrable cruiser. Its effectiveness will be greatly enhanced if surprise can be sprung upon the ship. It requires the very highest pitch of skill and training on the part of the pilots, and for that reason casualties among them will be serious, as they will be hard to replace. The weak point in the air torpedo scheme is that the pilot has to flatten out and hold his machine steady while he aims at the ship, and during that short time he should be an easy target for the anti-aircraft guns if they can get on to him in time. A torpedo, however, does not necessarily sink a protected ship, though it may put it out of action for a time.

As for bombing, capital ships have deck armour designed to withstand the 2,000 lb. shells from guns, and a 1,000 lb. bomb from the air is less formidable. In level bombing



Floatplanes are used for catapulting off cruisers and capital ships. This *Flight* photograph shows a two-seater fighter-reconnaisance Osprey stowed on its catapult on board H.M.S. *Leander*, a 7,000-ton cruiser.



The squadrons which are embarked in carriers are composed partly of naval and partly of R.A.F. personnel. The machine shown is a torpedo-bomber Baffin. (*Flight* photograph.)

* William Clowes and Sons, Ltd., 25s.

the aircraft must fly high enough to allow the bomb to reach its terminal velocity, and respect for the anti-aircraft guns of the ships will probably keep them still higher. Naturally, the higher the bombers fly, the greater is the chance of missing their mark. One writer in the *Annual* anticipates that such duels will usually be drawn. The bombs will miss the ships, and the guns will miss the aircraft. It is admitted, however, that the numbers of aircraft employed are an important factor. It will probably be found (if war ever comes to make the test possible) that a certain number of bombers are about a match for a certain number of ships. If you increase the number of aircraft, the chances of the ships being damaged are increased.

Dive bombing is much more likely to score hits, but the damage to a heavily armoured ship is not likely to be very serious. The dive bombers now used are light aircraft carrying not more than 500 lb. of bombs in all. In order to secure accuracy they sacrifice velocity, and are not likely to penetrate heavy deck armour. Against light ships they may do a lot of damage. In fact, the writers think that the danger which a Fleet runs from the attacks of hostile bombers and torpedo-planes is of far less importance than the advantage which it gets from its own reconnaissance and spotter aircraft. They bring the guns into action sooner and with better effect, and the gun is held to be the Navy's best weapon. One writer, after saying that fleet fighters cannot give very much protection, says that the best use to make of the attacking aircraft is to concentrate them on the enemy's carriers at the earliest possible moment. The guns will deal with his fighting ships. The writer who considers the case of air attack on a fleet in harbour, however, is not quite convincing in his attempt to minimise the danger to the ships.

Shore-based and Ship-borne

The section contains a very interesting analysis of the difference in functions of ship-borne aircraft and shore-based aircraft, and of aircraft from a carrier and catapult aircraft. The chief drawback alleged against shore-based aircraft is that from want of intimate nautical knowledge on the part of their pilots or captains they may be misled by ruses and waste their energies. This applies, it is to be understood, to both bombers and flying boats. The range of such aircraft is also limited by the fuel capacity. None the less, it is evident that the writers want the Navy to have its own squadrons of flying boats. As their range is greater than that of carrier aircraft, they can reach a spot within that range more quickly than any other craft can do, and so reconnaissance is expedited—a matter of supreme importance to all admirals. In this connection it is very interesting to note that Mr. Hector Bywater, naval correspondent of the *Daily Telegraph*, has prophesied that the coming orders for auxiliary ships will include some mother ships for flying boats. If the difficulties of refuelling a flying boat in a moderate sea can be overcome, such aircraft may well prove the best of all vehicles for fleet reconnaissance. When hunting for an enemy, an admiral does not place too much reliance on reports of position sent in by shore-based aircraft, and will trust far more to reports from machines which have started from his own ships.

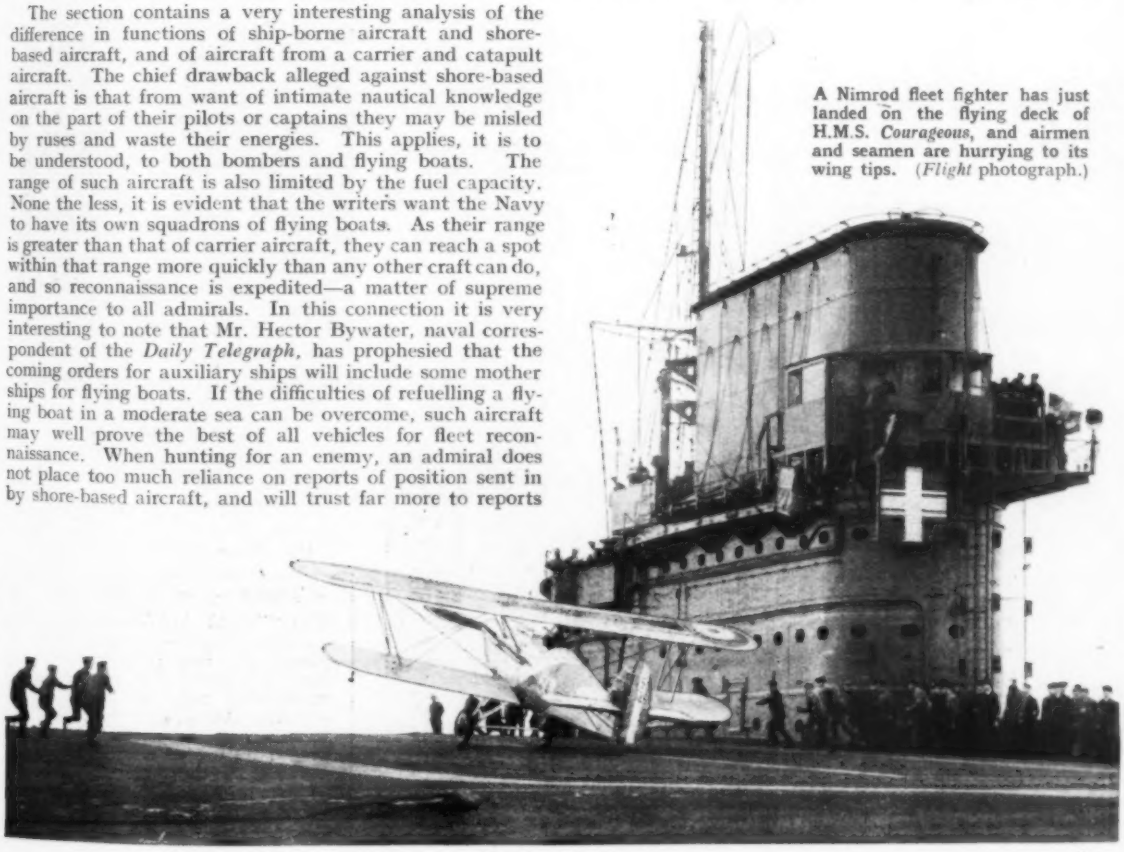
Carrier aircraft can do general work for a fleet, but for spotting for the guns of a ship it is held that catapult aircraft from that ship are more useful. For one thing, and it is an important point, the gunnery officer and the air observer are shipmates and know each other's ways. Great stress is laid on the chances of losing the catapult aircraft when they return, and on the difficulty of operating seaplanes in "quite normal ocean conditions." One writer, who signs himself "Zetes," writes as if he is actually ignorant that the catapult aircraft in use in the Navy are seaplanes. The danger of losses is, however, easily apparent to all. It may be added that some believe that the catapult machines must be flown off before the guns of the ship are fired lest their rigging should be thrown out of gear by the shock.

There are innumerable other interesting points in these articles, some of them quite contentious, but space forbids us to discuss them. We may sum up the conclusions, as they appear to us, as follows. The reconnoitring and spotting functions of aircraft are vital to a fleet, but their striking powers are uncertain and untested. The defensive utility of fleet fighters is limited. Carriers are very vulnerable and are likely to be the first object of attack in a fleet action. Catapult aircraft are, on the whole, the most useful, but many of them may be lost when landing on the water. Shore-based aircraft are very useful within their range, provided that the crews are well trained in naval work. The Navy should have its own flying boats.

One can hardly help supposing that in a fleet action it will not be very long before the skies are fairly clear of aircraft, with the carrier decks holed and the seaplanes foundered, and the ships fighting it out in the old Jutland style.

Incidentally, the Air Section of the *Annual* takes up eighty-four pages of text.

F. A.-DE V. R.



A Nimrod fleet fighter has just landed on the flying deck of H.M.S. *Courageous*, and airmen and seamen are hurrying to its wing tips. (*Flight* photograph.)

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

THE China Flying Club was recently organised in Shanghai. Membership is limited to Chinese.

The French Air Ministry has decided to give the *Pou-du-Ciel* a test in the new wind tunnel at Chalais-Meudon.

The Handley Page bomber-transport monoplane is having its Tigers replaced by a pair of Pegasus IIIs.

Lt. Gen. Wever, Chief of the General Staff of the German Air Force, was killed at Dresden last week in a flying accident.

The Greek Government is to ask Great Britain to send a mission to Athens to assist in modernising the air force and training the personnel.

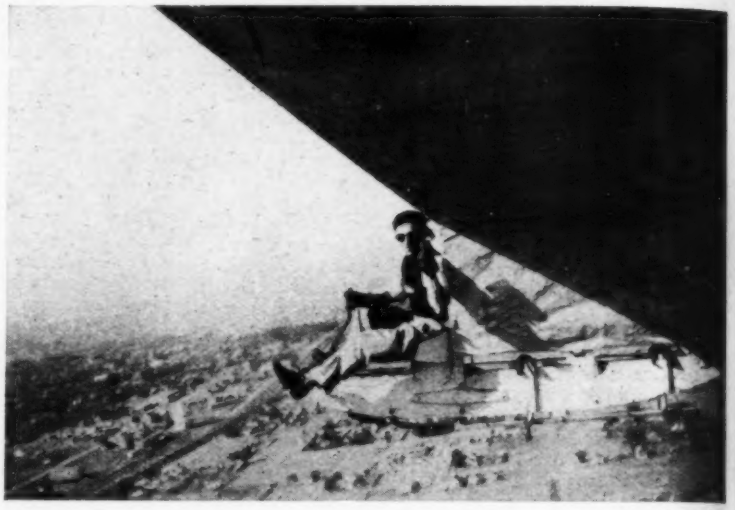
The military aircraft factory to be built at Longbridge by the Austin Company will cost about £1,000,000, and should be completed in six months.

"Benny" Howard's four-seater cabin monoplane modelled on the lines of his racer, *Mister Mulligan*, does 202 m.p.h. with a 320 h.p. Whirlwind and lands at 46 m.p.h.

An order for a suit to be used by the pilot of the Bristol machine which is being built to attack the heavier-than-air height record has been placed by the Air Ministry with Siebe, Gorman and Co.

A plan to explore 600,000 square miles near the South Pole is being considered by Mr. Harold I. June and Lincoln Ellsworth. It is claimed that this part of the continent has never been seen by man.

An air line between Addis Ababa and Rome is being organised. At the moment three-engined bombers are operating a mail and passenger service. No decision has yet been made on the route, but it will probably touch at Diredawa and link up with the Jibuti-Assab-Asmara service.



FROM AN AIRY PERCH in a primary sailplane, Mr. W. P. Stevens, a Canadian reader, took this photograph of himself with the aid of a camera on the wing-tip and a length of cotton. The photograph was taken 800ft. over the city of Lethbridge, Alberta, a district abounding in "thermals" of a kind to delight the soaring pilot.

Mrs. Amy Mollison has arranged to fly a B.A. Eagle cabin monoplane in the King's Cup Race. Fitted with a Gipsy-Major engine, the machine has a maximum speed of 150 m.p.h. with undercarriage retracted.

The Admiralty has decided to equip the old aircraft carrier *Argus* as a tender for *Queen Bee* wireless-controlled targets. At least eight machines will be carried. The vessel will also be fitted with the latest deck-landing apparatus for training Fleet Air Arm pilots.

THE KING'S CUP, the first presented by King Edward VIII. The race takes place on July 10 and 11.

A FLEA ON SKATES: Built by an aircraft engineer to the order of a Montreal private owner, this *Pou* has performed well. The mysterious erection on the tail is actually the St. Hubert airport airship mooring mast, in the background.

Twenty-five Years Ago

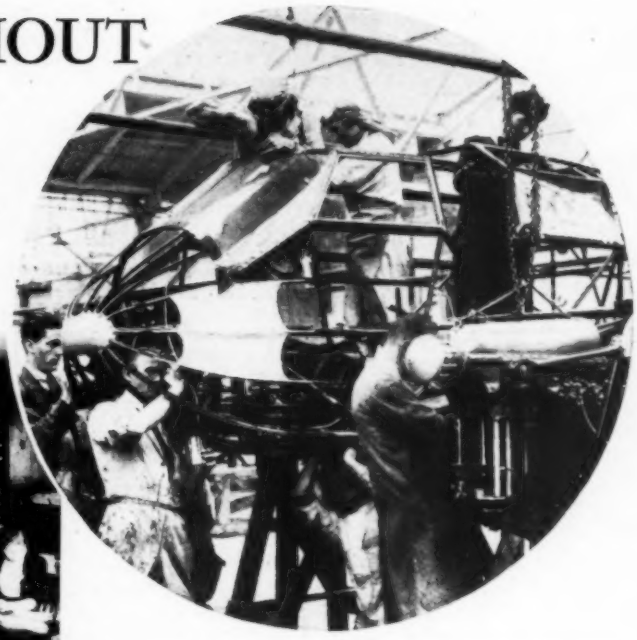
(*From "Flight" of June 10, 1911.*)

"The Valkyrie designer then piloted the new type 'B' military monoplane and put up a magnificent flight of nearly 40 minutes. Ascending to a height of from 2,500ft. to 3,000ft. he descended by one of his well-known *vol planes*, then executed two circuits with both hands off the controls and above his head."

COSTING WITHOUT TEARS

—*As Applied to Aircraft Manufacture : Some Notes on a Modern Method*

By S. J. NOEL-BROWN, F.A.I.A., F.A.C.S., A.I.S.A.



WHY is it that the aircraft industry is such a long way behind others in connection with modern methods of manufacture, and particularly in costing procedure? It may be argued that the Air Ministry can be held to blame on account of its I.T.P. system, but, much as one may be pleased to blame the Ministry, this cannot be true in every case, as we find manufacturers of civil and commercial aircraft are also many years behind the times.

The Air Ministry is particularly active at the present time investigating the costs relating to aircraft contracts, and the statements made above may be said to be endorsed by questions contained on a questionnaire circulated a month or so ago to manufacturers.

One of the questions reads: "Are cost accounts as well as financial accounts kept? If yes, are they part of the financial accounts—are they reconciled with the financial accounts?"

It would be interesting to know how many firms, in replying to the questionnaire, were compelled to say that cost accounts are not kept as well as financial accounts. Also, one ventures to suggest that but a very small percentage could say that their cost accounts were reconciled with their financial accounts.

As a general review, what are the main objects of cost accounts?—

(1) To register details of the cost in labour, material, works oncost or establishment charges, and overhead charges of manufacturing an article, not only the finished article, but the cost at each stage during the process of manufacture.

(2) Completed figures, whether they refer to manufactured articles or the components, furnish reliable information for the estimating of future operations. It is perhaps more important. It enables the management to ascertain whether the work is carried out at a figure which will bear competition.

(3) Cost accounts provide a check on the workmen, register any wastage of time, constitute a check on materials issued for use in the factory, and any relative waste.

(4) Cost accounts should dovetail with the general financial accounts of the company, and each and every component part or finished article should bear its due proportion of the works oncost and overhead charges.

It is so often said that "the aircraft industry is different." How accustomed one is to hearing this said of the industry in general; and what a fallacy! Another argument is that costing in detail involves considerable staff and cost. If the old methods are adopted, and an army of clerks employed to produce the information, this may be so; but in these days of modern costing machinery such an argument is without foundation.

During the past four months, managing directors, accountants, cost accountants, and executives of aircraft manufacturing concerns have investigated the system in use by General Aircraft, Ltd., at the London Air Park, Feltham. One and all have expressed surprise at the amount of up-to-the-minute information and material available from the system and the small staff employed to produce it.

The economy in staff is due to the introduction of the Hollerith Punch-card System and relative machinery. The system was introduced on January 1 last, and the changeover from the old to the new system was carried out in the course of a few hours without a hitch of any kind.

Staff and Equipment

The total staff in the costs and wages departments consists of eight persons. Five of these are girls under sixteen years of age, and two young women, and one man. Included in this figure is the comptometer operator, whose services are also called for in connection with other purposes outside the costs department. The machinery involved consists of one tabulating machine, one sorting machine, three punches, two verifiers, and one comptometer. The total weekly cost, inclusive of machine hire and maintenance charges, is less than 1½ per cent. of the weekly pay-roll, or less than 1¾ per cent. of the total works oncost and overhead charges.

The system furnishes the following:—

Daily.—Daily labour allocations shown against each individual part or drawing number summarised under each department, each production order, and under each individual job number. Each individual tabulation registers the flat labour cost, the overtime cost, and the cost

day by day of any replacements which may be due to works scrap, works loss, or drawing-office modifications. Daily costs are also shown under each machine number and under each production order in respect of minor or major assemblies. The stores issues covering all materials are scheduled daily, registering the total cost to each department under each production order and under each job or machine number. Thus, it will be seen that a daily control is available as apart from detailed information supplied, which is submitted to the executive members of the staff concerned. It enables daily returns to be furnished to the managing director, which give him the total factory wages for the previous day—productive and non-productive—split up under the various production orders or programme.

Weekly.—The punch-card system takes care of the weekly bonus schedule, and produces a bonus pay-roll giving full details against each man's clock number of the total bonus earned, including the actual job or drawing number, number of hours he is allowed, number of hours taken, number of bonus hours to his credit, and the actual £ s. d. amount detailed as his total. These figures are again reshuffled, and are furnished in weekly form showing the relative efficiency as regards bonus for each department, each production order, and each job number.

Wide Application

The system also takes care of the weekly payroll for the entire factory and office. The clock cards are computed by a separate comptometer operator, the full information thereon transferred to punch-cards, and finally run off on the machine. The actual printing, totalling and analysis of the wages sheets takes less than three hours. Here again a pay slip is prepared, giving details for insertion in each pay envelope. The information given may be appreciated by the fact that the total details supplied for insertion in the employees' wage envelopes often runs into a roll well over 50ft. in length. After the payroll has been completed the cards are reshuffled and furnish individual returns giving details of hours worked and paid in each single section, and the classification of the type of labour.

Before the payroll can be completed a standard deduction schedule has to be prepared, and this furnishes total deductions for each individual in respect of National Health, Unemployment Insurance, social club deductions, savings club, hospitals savings deductions, and superannuations, and also furnishes the grand total of each deduction under each heading. As already explained, the labour analysis is compiled daily, and these are agreed weekly with the total of the payroll.

The total value of orders placed by the buying department is scheduled weekly, and the value of every order and its relative number is shown in detail. This is further analysed, showing the individual cost under each production order.

After the daily analysis of labour and material has been completed, and reconciled with the actual wages paid, a schedule of jobs completed during the week is then prepared, which registers the actual cost of any job, part, or component completed in the factory during the week, showing labour, overtime, bonus and material costs. These figures are then added to works oncost and overhead charges.

Monthly.—The system also takes care of the purchase journal and the purchase ledger. Invoices as received are recorded on punched cards and analysed by machinery under various headings. Monthly schedules are prepared under the heading of each supplier, and this summary and the purchase journal summary furnish details in the nature of books of original entry and in lieu of the purchase ledger.

General.—In addition to the daily, weekly and monthly returns, cards furnish a complete review of any job or production order at any time. They are also used to give a detailed works progress stock record, and furnish weekly costs of:—

(1) Work in progress of the entire factory.
(2) Value of stocks in finished parts store.
(3) Value of stocks under their various headings in any of the raw material stores.

One may be prompted to ask, "How is all the information obtained?" Also, it has been suggested that a good deal of clerical labour is involved in the initial stages to furnish the information before particulars ever reach the costs office. This is not the case. The system as divorced from the costs office is actually the same as was in force before the Hollerith machinery was introduced. The time-keepers provide daily allocations of labour, the ordinary stores requisitions provide the information for the stores summary, the bonus cards furnish the details for the bonus schedule, and finally the employees' own clock cards give the information necessary for the compilation of the pay-roll.

The entire system dovetails week by week, month by month, and year by year, with the financial accounts.

Furnaces for New Engine Factory

ORDERS for electric furnaces to carry out the whole of the heat treatment at the new Alvis aero engine factory have been received by Birmingham Electric Furnaces, Ltd., of Tyburn Road, Erdington, Birmingham.

The equipment comprises "Birlec" furnaces for nitriding, stabilising, carburizing and reheating, and also for the complete heat-treatment of steel and aluminium alloy forgings and castings.

Other special furnaces are being installed for the heat-treatment of high-speed and carbon steel tools and cutters.

Supercharged Ultra-lightweights?

EXPERIMENTS with a supercharged Austin Seven car engine with a view to its adaption for ultra-light-aircraft work are being made by Mr. Peter Almack and by Mr. G. S. Davidson, of the Midland Aero Club. Mr. Almack hopes to achieve the desired power increase by use of low-pressure supercharging, which will not involve greatly increased crankshaft speeds and should not produce unreliability, but which will bring the power-weight ratio to the necessary proportions. So far the Almack-Austin engine has not been bench-tested, but from extensive experimenting with the blown Austin unit in racing cars, Mr. Almack estimates that it will give 40 b.h.p. at 3,500 r.p.m., run safely up to 3,800 r.p.m., and not weigh more than 150 lb.

A new cooling system has been evolved to work in conjunction with a honeycomb radiator. Cylinder head and sump are of aluminium alloy, and a new crankshaft and redesigned connecting rods and pistons are used. Ignition is by Scintilla Vertex magneto, replacing the coil set. The airscrew will be driven from what in a car is the clutch end of the crankshaft, a special outsized bearing being used, in addition to the normal back-main thrust bearing. The oil pressure has been raised to 40-70lb. sq. in. by the simple expedient of altering the oil-pump driving gears, and an external oil-cooler is incorporated. A new, straight exhaust manifold feeds into any desirable shape of off-take pipe. The supercharger is a Marshall-Roots, mounted alongside the cylinder block. It draws from a single Solex carburetter and delivers at 4lb./sq. in. at 3,500 r.p.m. and at 6lb. at 4,000 r.p.m. The engine has a compression ratio of 6.6 to 1. Mr. Almack emphasises that his efforts so far are merely experimental.

Alloy Sheets and Strip

A NEW company has been registered under the name of Reynolds Rolling Mills, Ltd., for the manufacture of aluminium and magnesium alloy sheets and strip and allied products, as an extension of the aluminium alloy products in tubes, bars and sections already being made by the Reynolds Tube Co., Ltd., at Hay Hall Works, Tyseley.

Some exceptionally fine buildings near Birmingham, already in existence, will be taken over, and it is anticipated manufacture will begin in a few months' time.

The company is a private one, the £200,000 capital being subscribed for by Tube Investments, Ltd., and High Duty Alloys, Ltd.

The registered offices are at Hey Hall Works, Tyseley, Birmingham.

Correspondence

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.

THE I.O.M. AIR RACES

I SHOULD like to take the opportunity of commenting on the Hanworth to Isle of Man Air Race on May 30, regarding the finishing line at Speke aerodrome. I have been given to understand that the last-minute change (putting the line outside the aerodrome) was made for the safety of air liners. In my opinion this was much more dangerous, as competing pilots had to make several turns in their efforts to locate this line, and it would certainly have been much safer had it been put on the aerodrome where it could have been seen by everybody.

Whoever was responsible for the marshalling at Speke did the job very badly. The majority of the pilots could not find a marshal at all, and it was only after having been on the aerodrome for three quarters of an hour that I was informed that I had not flown over the correct finishing line.

In fairness to the organisers of the race, I must say that the rest of the organisation was perfect, and I think that Captain R. H. Stocken deserves full marks. L. LIPTON.

London, E.3.

THE RADIO MAN'S LOT

"EX-MARINE'S" letter in last week's issue regarding W/T. operating efficiency has, I am sure, been heartily agreed upon by all.

Aircraft radio operating has been my way of earning a poor living for many years, each winter bringing with it the same thought: "Will I live to see next summer, or will someone be the richer by my insurance?"

We all want a high standard of W/T. operating, yet it cannot at present be reached, the reasons being (a) because our Air Ministry continues to present licences to anyone who can tap a morse key and twiddle a knob; and (b) because the majority of good operators have enough sense to realise that they are up against a brick wall and four pounds a week until such time as they are too old to work; consequently, they prefer a steady ground job and a better chance of living to enjoy a pension, which they don't get in the air services. "SPARKS."

Croydon.

APPARENTLY "Ex-Marine" does not realise that the powers who employ us are so raw to the technique of W/T. operating that they think any man with the necessary ticket can cope with the job. And it will not be until we have an accident on a part with the *Titanic* disaster that the necessity for employing only experienced W/T. operators will be realised.

Airline work is definitely not a job for the *ab initio* operator or for the ex-R.A.F. man, with his bare twenty words a minute and inability to read through jamming.

Give operators pay commensurate with the risks they have to take—then you will attract men who can really handle the wireless side of the job as well as the pilot's bag!

Croydon. "NAUTIC."

COMMERCIAL AIRCRAFT REQUIREMENTS

THE article contributed by airline and charter operators to *Flight* of May 21, under the title "What the Operator Wants," and your Editorial comment thereon, form an interesting basis for discussion.

Admittedly that particular issue of *Flight* should have a special appeal to commercial operators and aircraft manufacturers; but I am wondering if reference to "What the Operator Wants" really helps the manufacturer. You say there is no such thing as an ideal aeroplane for commercial purposes, if the views of the various operators are to be taken seriously. Why should there be? Is there an ideal motor car, bus, or coach?

Let us consider the class of business conducted by the operators expressing their requirements:—

(1) Special charter—with particular interest in Press work.

(2) Special charter of a different type—expensive charter for expensive people—coupled with ferry or short internal services.

(3) Internal and external mail and passenger services by a subsidised company.

(4) Special charter, chiefly for Press and film work.

Can these be said to be representative of British commercial air operators? No. 1 wants single-engined machines, cruising at 130 m.p.h.; No. 2 advocates frequency—high speeds not necessary; No. 3 advocates speed with economy, says public opinion demands four engines; No. 4 wants less expensive aeroplanes, but with increased speed and safety.

Pity the poor manufacturer! What is he to do? Is not the answer in that one important term "commercial operator"? To operate on a "commercial" basis should mean on a "profitable" basis without subsidy. That being the case, we must divide the types of operators. I suggest as follows:—

Airline Operators.—(1) Distances between 200 to 700 miles with reasonable traffic and mails; (2) internal services between 100 to 200 miles with very little traffic; (3) ferry services from 10 to 80 miles.

Special Charter Operators.—(1) Luxury airliners for tours; (2) business men's machines for quick transport; (3) rapid, reliable aircraft for Press work; (4) Go-anywhere, anytime, any-weather charter work.

I give only seven different examples, and yet it might well be said that each calls for a different type of machine. I suggest as regards the airlines, category Nos. 1, 2, and 3 can all be embraced under one term "economic operation." Yet each is in an entirely different class.

Economic operation for No. 1 class means medium-sized, speedy aircraft. The economics govern the number, or, alternatively, the size of the engines or horse-power, and horse-power in turn controls the size of the machine, and hence the passenger capacity. The most economic aircraft to-day will give a cruising speed of nearly 200 m.p.h. for 80 h.p. per passenger. Increase the h.p. per passenger by a small percentage and operating costs increase by more than double that same percentage.

Look at it from another point of view. The first essential of airline operation is regularity on schedules, which must allow for delays due to head winds. During 1935 winds of 12 miles per hour or less velocity were experienced for 92 per cent. of the year, above 12 but less than 25 m.p.h. 7.5 per cent., and over 25 m.p.h. 0.5 per cent.

Aircraft power plant should therefore be sufficient to enable aircraft to maintain their schedule with head winds up to 25 m.p.h. without exceeding the maximum permissible cruising power. Thus, with normal light winds, journeys can be made well throttled, and the degree of throttling is greater with slow machines than with high-speed types.

Economic operation for airline operator No. 2 calls for smaller aircraft, with their attendant lower operating and overhead costs, but greater frequency. Peak loads—if any—can always be absorbed by frequency, better than by any other method.

To sum up under economic operation for airline operators, assuming a reasonable supply of passengers or goods is available, the revenue-earning capacities of aircraft for equal payloads over any period depends on their block-to-block speeds.

On the longer routes where the block-to-block speed approaches the cruising speed, it can be shown in £ s. d. that it pays to expend up to 100 h.p. per passenger, provided the power is used efficiently, as on modern high-speed aircraft, and still show a margin for profit, without subsidy, for a rate per passenger mile which compares favourably with existing rates.

At the other extreme, on short ferry work, the time taken at each end for take-off and landing has a curiously levelling effect on aircraft, so that block-to-block speed is much the same for high- and low-speed aircraft. Under these circumstances the lowest-powered machine shows the greatest economy, and satisfactory operation can be obtained with as low an expenditure as 20 to 25 h.p. per passenger. Considerations of safety (such as the failure of one engine) may impose a higher limit.

Between these extremes the most economical method of operating any given service can be arrived at mathematically

by consideration of obtainable efficiencies, and probable revenue.

What an operator requires is the most efficient type of aircraft for his particular service, and the only way of arriving at a correct solution to the problem is by logical consideration of the economics of operation.

The special-charter operator is usually of the owner-pilot category, and invariably knows better than "the other fellow." He handles so many different types of aircraft. Tell him that, however, and he immediately blames the manufacturers. The demand for cheaper, but faster and safer types is surely unreasonable. Cheaper aircraft can only come with the quantity standard production. Manufacturers have tried standardising types, colour schemes and equipment, but the operators have not backed them up. When charter operators really know what they want and are all in agreement, then they may rest assured that the manufacturers will meet them.

S. J. N. B.

Hanworth.

THOSE FRENCH AIRPORTS.

MAY I blow off some steam about a journey to the Continent a few weeks ago, or, rather, about one particular aspect of it? First of all, most of my trips abroad mean starting somewhere about 8 o'clock in the morning from Croydon, and I like to go there in my car, because the Victoria terminus is absurdly out of the way as far as I'm concerned. I am not absolutely certain that the Air Ministry garage at Croydon won't be full up, and in the early morning I am in rather a state to be pernickety, so that I cannot really see why there shouldn't be a decent garage at Croydon.

Next—and here's that particular aspect referred to above—there is the food question. Now, for some reason that to me is a mystery, the air line by which I have to travel apparently don't believe in giving you anything to eat. They do, it is true, hand you a very beautiful little folder, or card, which, among other things, mentions that you can actually get some Bovril, as far as the run from here to Paris is concerned, but when I have asked for Bovril I have generally been informed that there isn't any, but (with accents of great appeal) there *is* some whisky.

Then you arrive at Le Bourget. Now Le Bourget strikes me as rather dirty, slightly untidy, and not at all comfortable. There is about a quarter of an hour to spare there, and by the time one has gone through the Customs, ten minutes; in that time it is first of all difficult to find the café, if there is one, and secondly it is extraordinarily difficult to convince anyone that you want something to eat quickly. In fact, the whole thing is a sort of *dolce far niente*, and not so much *dolce* at that!

I agree that any Frenchman considers something cold, with a little coffee, is not a good lunch, Gaelic ideas tending to ceremony and an hour or two of real eating that you want to get down to and enjoy; but at Basle, for instance, there is a little café which seems able to serve what you want quickly, and you can get quite a lot to eat in the time. Very well, then. Le Bourget does, of course, possess a bar, in charge of a phlegmatic and quite imperturbable individual who is very nice, very polite, and wants to sell you little bottles of brandy, but that doesn't meet the case.

Very well. Off you go to Lyon, and there you repeat the process, because nobody really has any idea of serving you quickly, nor can you get anything reasonably good to eat or drink in the very short time you are on ground. The restaurant is very much better than that at Le Bourget, for all that, and is easy to find. Once I even wanted some chocolate, but all I could get was what looked like a small cake of some brand, and the much-harassed waiter had to make three visits before I could get three small portions.

Still hungry, you then go to Marseilles, and at Marseilles the accommodation is ten degrees worse than anywhere else, nobody apparently having any idea of where the café is; but I did once find a rather dark and not too pleasant place where they produced eggs that were just lightly warmed, and were enthusiastic about the merits of a piece of concrete-surfaced bread on top of another similar piece with what was undoubtedly meant to be ham in the middle!

Still hungry, therefore, you go from Marseilles to Cannes, and Cannes aerodrome must be the worst in the world. When I landed last there was some talk of having to send up rockets so that the ground staff could discover where the machine was in the jungle, and timidness on account of tigers prevented anybody from leaving the machine to get through the undergrowth to the ground stop. It wasn't, of course, the air line's fault that on one occasion a machine sat solidly down in the mud, and we then had to motor to Marseilles in a large old-fashioned car, with no shock absorbers, and a general air of having seen better days; and I might say that on that particular occasion the other passengers and I refused to go on one yard until we discovered something to eat, though the something was entirely unsatisfactory.

Branching off the main subject, I cannot think why the Riviera, of all places, should exhibit such shortcomings to the foreign visitor. A resort that keeps on saying how magnificent it is and doing all sorts of things to make itself exciting and beautiful, might, you'd imagine, contrive a decent aerodrome, and the place for that aerodrome is somewhere about Nice.

As a mere incidental, they forgot to put any labels on my luggage, so that it eventually had to be rescued from an enthusiast who wished to take it away at Marseilles instead of sending it on to Cannes, and there was the little episode of the flock of sheep, or goats, complete with ancient shepherd, to whom a red flag had been tied, which, to say the least of it, was intriguing.

Now the whole point of this is, why can't they use some imagination? It really wouldn't take much management to arrange for light refreshments to be available quickly in the entertaining surroundings as provided at aerodromes in most other countries.

Mind you, we are not much better ourselves, in some ways, for I bought a luncheon basket from the hotel at Croydon for a vast sum of money, and it contained:—

A banana (Brinnell No. 8).
One wing of 'plane or some sort of bird not too appetising to look at.
A piece of cheese which was definitely good.
A large piece of butter.
A wooden fork, and
A knife.

Now, what I want to know is, what were you supposed to do with the butter?

CHARLES HOUGHTON.

Walton-on-Thames.

[The recent case of the lady who was rushed to hospital after alighting at Gravesend Airport, having inadvertently plugged her ears with the official chewing-gum, suggests one solution.—ED.]

IN BRIEF

Model aeronautics enthusiasts in the Harrow district are invited to communicate with Mr. T. O. White (27, Hibbert Road, Harrow Weald), who is forming a club.

Mrs. Elise Battye writes to say that, owing to a serious illness, she will be unable to fly in the King's Cup Race as she had originally intended.

R.A.F. and S.B.A.C. DISPLAYS

REGARDED as the peak of the flying season, The Royal Air Force Display takes place at Hendon on Saturday, June 27, and will be followed on Monday, June 29, by the S.B.A.C. Flying Display and Exhibition at Hatfield, an event attended by prospective buyers of British products from all over the world.

Flight will mark this important annual occasion by the publication of two appropriate Special Numbers:—

THURSDAY, JUNE 25: R.A.F. DISPLAY NUMBER.
THURSDAY, JULY 2: R.A.F. and S.B.A.C. DISPLAY REPORT NUMBER.

The first-named, which will appear to-day fortnight, will contain a number of special articles and some outstanding illustrations, the contents including a review of the aircraft and engine types to be seen at the Hendon Display, a guide to that event, and a guide to the "static" exhibits at the S.B.A.C. Exhibition. The second will include special and fully illustrated reports of both important events.

To prevent disappointment a regular order for "Flight" should be placed with newsagents.

Every Thursday FLIGHT Sixpence

For naval occasions: Spotter reconnaissance Heinkels of No. 2 Air Corps.

SWEDEN'S AIR ARM

"Flight" Visits the Swedish Royal Air Force at Home : Extensive Use of British Engines and Aircraft

(Illustrated by "Flight" Photographs)

PERHAPS because it is some way removed from war-minded Central Europe, one ordinarily hears little of the work and equipment of the Swedish Royal Air Force. Yet it is an efficient organisation, largely equipped with aircraft and engines built under licence from Britain, and its operational and training methods are thoroughly modern.

It was for these reasons that we desired to see it at closer quarters. A visit to Sweden for the Stockholm show provided the opportunity, and General Friis, Chief of the Air Force, kindly gave us permission to visit, and fly with, the squadrons.

As at present constituted, the Swedish Royal Air Force is divided into five Air Corps. No. 1 is situated at Västeras-Hasslo, a bomber squadron and a fighter squadron being stationed there; No. 2, stationed at Hägernäs, deals with naval co-operation; No. 3, at Malmslätt and Karksborg, and No. 4, at Ostersund-Frösön, do army co-operation work. Flying training is carried out at Ljungbyhed, near Malmö, and this unit is designated the 5th Air Corps.

Up to the present time all officers have been seconded from the army or navy for a period of five years, but from now onwards there will be direct entry into the Air Force. Other ranks enlist directly into the Air Corps, and there is a leavening of conscripts who serve for two hundred days.

Very wisely, for an Air Force of this size, most of the flying equipment is built under licence in Sweden, enabling them to select the machines and engines most suited for their purpose. With the exception of training aircraft, all machines are fitted with Bristol engines built by N.O.H.A.B. at Trollhätten. The Hawker Hart and Osprey, both with Bristol Pegasus engines, have been recently adopted, the former as a two-seat fighter and dive bomber, and the latter for fighter-reconnaissance work with the aircraft-carrier cruiser *Gotland*. More than eighty of these are under construction.

For army co-operation Fokker C.V.s are used, and Heinkel H.E.5 seaplanes take on the naval work. Despite

Västeras-Hässlo aerodrome, which houses No. 1 Air Corps. The fighters and bombers from this station operate independently from the army and navy, which each has a specialised air corps.

the enormous areas of water, no flying boats are used. The reason for this, of course, is that during the winter the Baltic Sea is frozen over and boats cannot be fitted with skis.

At the training school, *ab initio* work is done on De Havilland Tiger Moths, and Sk10s (Raab Katzensteins with Walter Castor engines) are used for advanced single-seat tuition. Each pupil spends one year at the school, putting in altogether about 170 hours' flying.

Two types of single-seat fighter are used—the Bristol Bulldog and the Jaktfalk, a Swedish-designed job, built at the railway carriage works at Linkoping.

In the time available it was impossible to visit all the stations, and we had to be content with trips to the 1st Corps at Västeras and the 2nd Corps at Hägernäs. Needless to say, we were received in the typically hospitable Swedish manner; but let no one suppose that work suffers in the cause of pleasantries. Everywhere the discipline is excellent, the

SWEDEN'S AIR FORCE.

(Top left) The pilot's pigeon: A short-wave (60-150-metre) direction-finding receiver and transmitter at Västeras. It operates via an Adcock aerial.

(Centre) As used by the Swedes and (incidentally) Persians: The Pegasus Hart which, with the Osprey, is in production under licence for the Royal Swedish Air Force.

(Top right and bottom left) Britain First: Three Bristol Bulldogs and six Swedish Jaktfalks show that Swedish pilots are no mean performers of two very difficult formations, "Echelon stepped up" and "Line astern." The Bulldogs are nearest the camera.

machines admirably maintained and, as can be seen from our photographs, the flying of a very high standard.

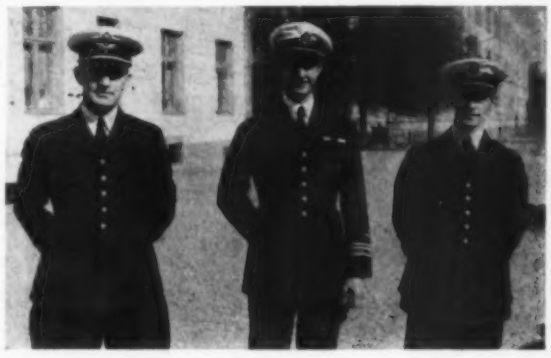
At Västeras the draft from the flying school arrives in the middle of May and is formed into a fighting school and a bombing school, instruction being continued until September. It is then divided into squadrons for service in the independent air force, as opposed to army or navy co-operation work. Bombing and firing is carried out on targets in Lake Vattern. At the top of a small hill at the rear of the sheds is situated the wireless station, where very modern equipment is installed, including a short-wave (60-150 metres) D/F set with Adcock aerial. The wavelength is changed periodically to prevent other interested parties listening in.

Night Flying

For night flying, a good deal of which is done by the bombing squadron, floodlights are used to illuminate the landing area. These are under the control of the officer in charge of flying, who directs operations from a position on top of the hangars.

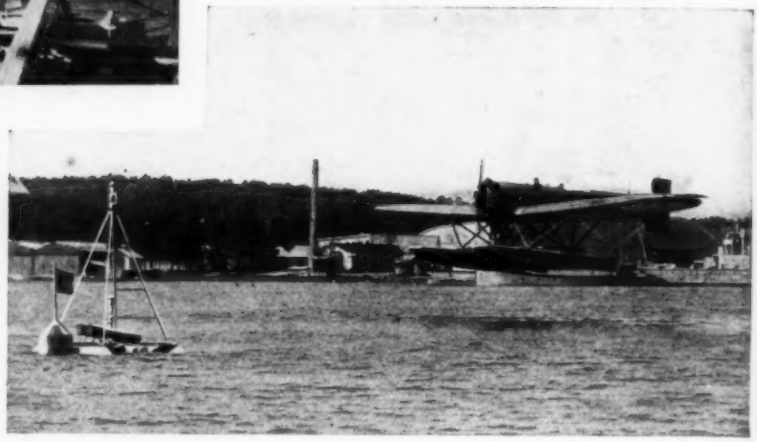
Roughly twenty kilometres north-east of Stockholm, the seaplane station at Hägernäs is in beautiful surroundings, and here the naval co-operation wing fly their Bristol-engined Heinkels. As at Västeras, the pilots arrive from the school at Ljungbyhed with their wings up, but have no seaplane experience.

The greatest problem which has to be faced is that of landings—forced and otherwise. For deep, soft snow, ordinary floats are apparently ideal—in fact, it was asserted that this was the most pleasant of all forms of landing. Ice with some snow presents another problem, and while they do land direct on the floats in such circumstances, a small ski fitted to the base of each pontoon is more serviceable. For forced landings in the forests with which Sweden abounds the big floats and multiplicity of undercarriage struts on the Heinkels ensure that the machine shall sit on a sufficient number of trees at once to prevent damage to the crew. Between-season flying is the greatest



In command at Västeras (left to right) : Sqn. Ldr. Ekman (Fighter Squadron), Wing Cdr. E. Tornberg, commanding 1st Air Corps, Sqn. Ldr. R. Carlgren (Bomber Squadron).

(Left) Hawker Ospreys reposing on the after deck of H.M.S. Gotland, the Swedish navy's aircraft carrier. The catapult is said to be capable of getting eight machines in the air in five minutes.
(Below) Night-flying aids : A Bristol-engined Heinkel of No. 2 Air Corps landing alongside one of the flare floats. The two dissolved acetylene containers can be seen just above water level.



problem of all; although the ice is tested for thickness three times a day it is only when a machine eventually goes through, with perhaps unfortunate results, that the arrival of spring is confirmed.

Night flying takes place three times a week, and two floodlights of 2,200,000 candle-power each are available for lighting the area if necessary. The flare path is particularly efficient. It consists of three pyramidal structures on floats anchored to show the wind direction. Each has two lights, one at the base and one at the apex; these are white, with the exception of the top light of the last pylon, which is red. The burners are fed with dissolved acetylene. Thus, not only is the direction of wind clearly marked, but the pilot can easily gauge his height above the water, even under glassy conditions.

No torpedo work is carried out here, but it is interesting to note that a new type of torpedo is being produced which can be dropped successfully from a height of fifty metres.

Civil Ambulance Work

A more humane task allotted to the Hägernäs Corps is the maintenance of an air ambulance for bringing in urgent surgical and medical cases from the more remote parts of Sweden, especially during the winter. For this purpose a Junkers W.34 is used.

To preserve the naval flavour all other ranks are housed in the warship *Gota*, of 1900 vintage, while the officers' mess is a houseboat moored alongside. The officers live in Stockholm, but very shortly permanent buildings are to be erected. The *Gota* is still mobile, and is used occasionally as a target ship.

The station boasts a very complete repair section, which is in the charge of Engineer Captain Falke. Complete overhauls of both airframes and engines are carried out, and there is a small machine shop to turn up any small fittings which may be required.

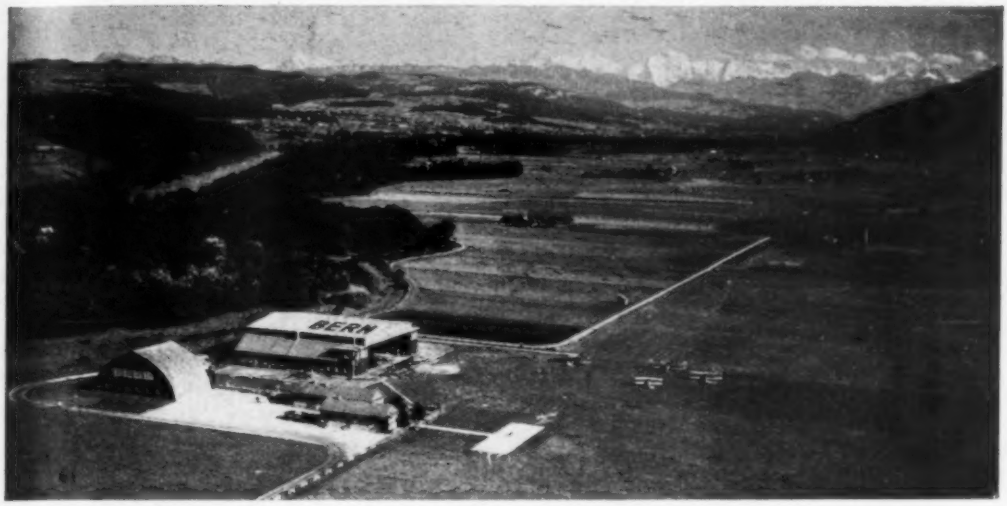
In addition to the usual ski-ing and skating, the more dashing element amuses itself with ice yachting, and speeds as high as 150 km./hr. are reached; but, as it was quaintly put to us, this particular pastime is the cause of many "cracked ribbins."

Finally, we must recount a small detail which caused great merriment during our visit. Before flying, we were fitted out with an Italian parachute, and there was much good-humoured speculation as to whether it was better to die rather than be saved by an Italian 'chute. Our feelings in the matter after the contraption had been fitted, and another binder wrapped over it to prevent it fouling anything in the machine and opening prematurely, were that death would be a pleasant relief. Anyway, one cannot imagine anybody getting much fun out of life if occasion should arise to use it, and sympathise with any Italians who had to bale out in Abyssinia, for truly they must have been between the devil and the deep blue sea.

Pilots and officers at Hägernäs (left to right) : Sub. Lt. Nylander, Ft. Lt. Weidling, Ft. Lt. Wennerström, Sqn. Ldr. Hård, Group Capt. H. Enell, Ft. Lt. Lennquist, Ft. Lt. Falk, Sub. Lt. Anderson and Sergeant Major Bareutheim.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



TOURING CENTRE : Berne aerodrome taken from the air, with the Bernese Alps in the background ; the highest point is the Jungfrau.

THE WEEK AT CROYDON

Operators and the Strikes : "Hanno's" Adventures : Ice Formation

EARLY last week the situation in Paris caused some alarm. Imperial Airways had only six days' petrol at Le Bourget, and it was planned to fly with full tanks from Croydon. When returning to England, arrangements had been made for refuelling, if necessary, at Lympne. British Continental Airways on their Lille service had something of the same problem—to which was added that uneasiness about what *might* happen in the immediate vicinity of a big manufacturing centre. Photographs in the newspapers showing Paris taxi-cabs standing idle with radiator placards remarking "*Plus d'essence,*" made one wonder what would happen to freight and passenger transport. It is a long walk to Le Bourget.

Up to now the adventures of Capt. Rogers in Lybia, when on a delivery flight to Cairo with *Hanno*, have not been mentioned, but since the Geneva correspondents of newspapers have now sent the story to their London papers, there is no further need for secrecy. Capt. Rogers had permission to fly over Lybia, and his papers were in order. He is too old a bird to disobey any local regulation, yet, when he landed at some Lybian aerodrome, he was treated like a prisoner, threatened with personal searching, and put under an armed guard of black troops with fixed bayonets. Probably it is best merely to say that this is hardly the friendly treatment received by captains of British airliners from most other nations.

The sort of flying weather we have had lately has not been bad in itself, but it is curious to find ice formation at 5,000 ft. in June, as a pilot on the London-Basle route did the other day. Ice, however, is not the bogy it is made out to be, and when cloud is not actually on the ground the pilot merely drops down to a warmer layer of air and melts the stuff away. Swissair is, I think, the only company which issues regular "ice-formation charts" to pilots. Roughly, these are contour maps of the country to be flown over, on which the contours of the clouds are also marked. At certain heights the probability of ice formation is shown, and I am told that these charts are accurate to within a mile or so. I am told that the other day, at an almost exactly predetermined height, ice formation began.

The first passenger from England right through to Hong Kong left last week by Imperial Airways. He is a Chinese merchant who probably takes the whole affair in the philosophic vein of his countryman who, when shown an aeroplane in flight for the first time and asked to admire the proceeding, saw nothing remarkable in it, because to fly was the very purpose for which the mechanism had been invented and made.

Like everybody else I went to Gatwick on Saturday. The buildings, gangways and subways are admirable, and the whole place has obviously been designed for the job. I don't think Croydon was, and probably those responsible were under the impression that it was to be a Battersea lost dogs' home or a large model of some well-known rabbit warren, wherein the ferrets could never find the rabbits. People, as *Flight* has already pointed out, seem to miss the main idea of Gatwick. As far as Croydon is concerned it is most useful to have another emergency airport, properly equipped and with full facilities. There is already Gravesend, and, thanks to the enterprise of Airports, Ltd., who own both, there is now Gatwick, also.

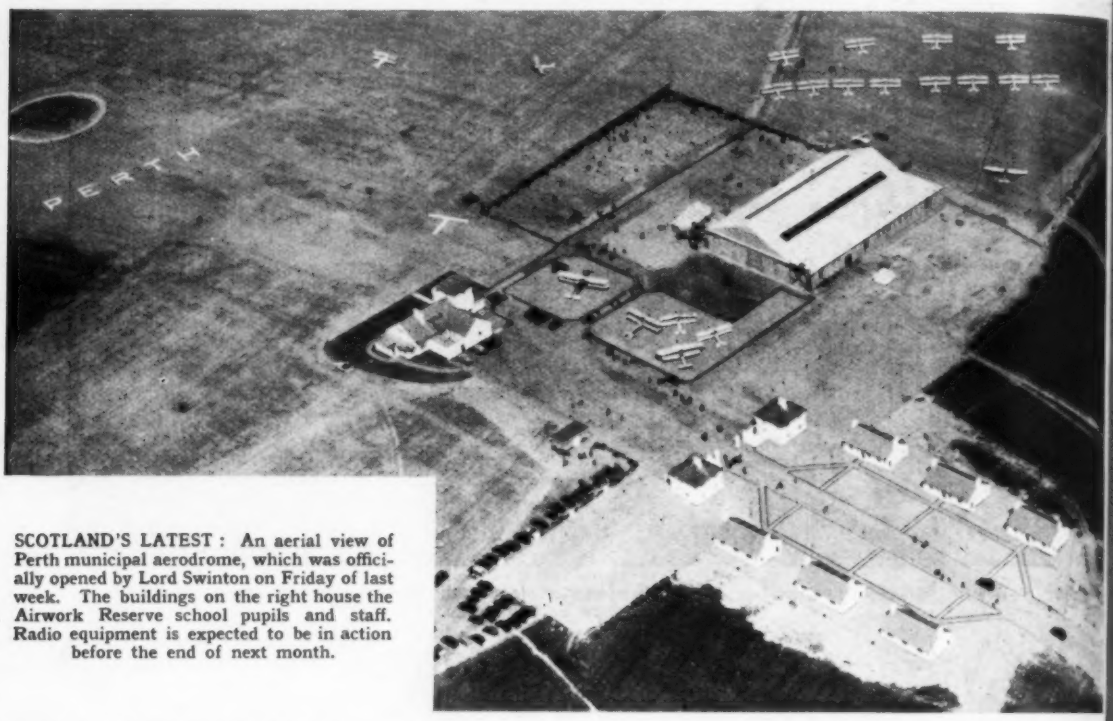
At Lille last week there was a ceremony concerned with the airport extension, at which Capt. Stead, of B.C.A., was presented with a medal by M. Thiriel, President of the Lille Chamber of Commerce. It commemorated the first British line to operate a London-Lille service.

A. VIATOR.

Commercial Aviation

SCOTTISH OCCASION

Viscount Swinton Opens Perth Municipal Aerodrome : Representative Gathering at Scone



SCOTLAND'S LATEST : An aerial view of Perth municipal aerodrome, which was officially opened by Lord Swinton on Friday of last week. The buildings on the right house the Airwork Reserve school pupils and staff. Radio equipment is expected to be in action before the end of next month.

FOR some time now the municipal aerodrome at Perth has been in use by the Reserve training school which is operated by Airwork, Ltd., and last Friday's event served rather to bring the completion of the airport and building plans before the eyes of the public. Lord Swinton, after officially declaring this important northern aerodrome open, flew south again to perform the same rite for Gatwick, the events at which airport are described on pages 616-619. He was met at Perth airport by Lord Provost Nimmo, and among the important guests was Lt. Col. Sir Francis Shelmerdine, the Director of Civil Aviation.

In introducing Lord Swinton, Lord Provost Nimmo said they were very proud in Perth that they had got a municipal aerodrome, for, although the Government passed in 1920 the Air Navigation Act which gave power to municipalities to construct aerodromes, very few municipalities had so far taken advantage of it. Perth had always been a transport centre and they were determined not to be behind when transport in the air was being developed.

Lord Swinton congratulated Perth on an admirable achievement. It was fitting, he said, that the ancient capital of Scotland and a great modern junction should have one of the great Scottish aerodromes. He congratulated the aerodrome committee on the site, and on all they had built on it. He was glad to know that arrangements were being completed for the establishment of a direction-finding radio station and congratulated them on the national service they had performed.

Councillor Primrose, in proposing a vote of thanks to Lord Swinton, wished him many happy landings, and expressed the hope that those landings might often be at Scone. As a memento of the occasion, he presented Lord Swinton with a salmon rod made in Perth.

The Secretary of State for Air was the principal guest at a luncheon held thereafter in the Station Hotel, Perth.

Perth's aerodrome, which lies some three miles to the north-east of the city, was laid out in six months and finished in January of this year at a cost of some £60,000, including the purchase of the necessary land. The landing runs vary between 1,000 and 1,400 yards, and the area totals about 250 acres. It is expected that the radio station, mentioned by Lord Swinton, will be available before the end of next month. Mr. P. J. B. Perkins is the manager.

D/F at Dublin

ON May 30 the new Dublin direction-finding station was brought into action and will be in operation daily from 8.45 a.m. until 4.45 p.m. The call signs are EIJ and "Dublin," and the wavelength 862 metres (348 kc/s).

Eight More for Air France

AIR France have recently placed an order with Dewoitines for eight new 338s, similar to the three now being used for carrying mail and passengers between Toulouse and Dakar. The new machines are to be used on the Far Eastern line between Baghdad and Saigon, and will carry twenty-five passengers. They are equipped with three 375 h.p. Hispanos.

Two Shetland Services

ON June 2 Aberdeen Airways inaugurated their service from Dyce (Aberdeen) to Orkney and Shetland with a through flight from Aberdeen, using the D.H. Rapide. The party included Viscount Arbuthnott and Mr. Gandar Dower, the managing director of the company, and the pilot was Mr. E. A. Starling. The D/F station at Kirkwall, of course, has been in operation for some little time, and that in Shetland should be working by now.

On the following day, Highland Airways, the pioneer operators in that part of the world, also carried out an inaugural flight from Inverness to Sumburgh with a D.H. Rapide. This service has been contemplated for a very long time, and its start depended upon the provision of radio.

Traffic in New Zealand

DURING the period between January 16 and March 28, this year, Union Airways (the chief pilot of which is Mr. B. A. Blythe, late of Jersey Airways) flew 71,575 miles in New Zealand and carried 12,012 passengers.

Traffic at Bristol

DURING the year which terminated on March 31, 1936, the traffic figures at Whitchurch were: Aircraft movements, 4,810; passenger arrivals and departures, 6,003; and freight, 2,520lb.

The new Adcock D/F station, which is to replace the existing mobile unit, is nearly ready and will shortly be undergoing tests. A customs officer is now in daily attendance between 11 a.m. and mid-day, though the usual notice is still necessary for clearance at other times.

Successfully Unsubsidised

MR. W. L. THURGOOD, who travelled to Jersey by his own air line last week, must look back with satisfaction upon the record of his company. When the first daily service between Heston and Jersey opened in January, 1934, there was a steady demand for seats, and this maintained a satisfactory level throughout subsequent winters, while bookings displayed the usual big summer increases.

Seven thousand passengers were carried on the London-Jersey route in 1934 and 8,668 in 1935—an increase of 24 per cent. In the first five months of 1936, 2,147 passengers have travelled on this route, but the bulk of the year's traffic is still to come in the holiday months of June, July and August.

By far the greater number of passengers is, however, carried on the company's service between Southampton and Jersey, which opened in 1933, and which is often used, for reasons of economy, by passengers from London. The Heston service calls at Alderney on request and Jersey is also reached by a twice-weekly service from Plymouth, with connections from Cardiff and the West of England. Twice-daily services each way between London and Jersey commenced with the Whitsun week-end and will be maintained at least until the end of September.

A municipal airport is under construction near St. Helier, Jersey, but many passengers will regret the substitution of an airport landing and short motor-coach journey for the existing beach landing at St. Helier itself. This beach landing, which, for the passenger, is one of the pleasantest sensations of the trip, requires from the pilots a somewhat special technique, and the fact that high performance aircraft have successfully used this beach for many months in all weathers speaks well for the standard of piloting. The company's record is free from any case of injury to a passenger.

Radio equipment is standard on all Jersey machines, and one, as already reported in *Flight*, is to be fitted with the Lorenz blind-approach installation.

FOR THE BASS STRAIT SERVICE: Holyman's Airways take delivery of their new Douglas D.C.2 after erection at Essendon (Melbourne). For the moment it is flying between Melbourne and Sydney, but it will eventually be put on the Melbourne-Launceston service.

Racing Specials

DURING this year British-American Air Services of Heston will be or have been running special daily services to forty-four race meetings at fifteen different courses and, in a general way, the bookings have been extremely satisfactory.

A Percival Vega Gull has just been added to the fleet, which includes also a D. H. Dragon Rapide and a Leopard Moth. The pilots are Messrs Edmunds and Meadway.

South Atlantic Expectations

ACCORDING to the results of calculations and tests, the two new four-engined flying boats destined for carrying mail and passengers on the South Atlantic service of Air France—the Lioré 102 and the Lioré et Olivier 47—are confidently expected to attain 200 and 225 m.p.h. respectively. Air France have, in fact, hopes of capturing from the Americans no less than eight world speed records with these boats. The French machines are required to have a non-stop range of 2,200 miles against a headwind of 30 m.p.h. with a crew of five, four passengers and 1,250lb. of freight.

The Lioré 102 has been carrying out preliminary flights at St. Nazaire since May 12, piloted by Sadi Lecointe, while the hull and wings of the Lioré et Oliver 47 have been taken to Antibes, where the machine is expected to make its first flight within the coming fortnight.

A Real Time-saver

THE Cardiff-Weston air ferry was initiated by Western Airways on May 31, utilising D.H. Dragons. This service shows very considerable saving in time over surface transport, the air journey occupying only ten minutes as against 2½ to 3 hours by train and 1 to 1½ hours by boat. The fares are 6s. 6d. single and 9s. 6d. return, and a very high frequency service has been put into operation. On Whit-Monday traffic was so heavy that no bookings could be effected after 2 p.m.

The interest of the Cardiff Corporation in this innovation has been indicated by the extension of one of their bus services to the airport on a twelve minute frequency, and, at Weston-super-Mare, a coach operated for Western Airways by the Bristol Tramways and Carriage Co. provides transport from the airport to the sea front.

In due course the institution of the other new Western Airways line, from Weston to Birmingham, will be instituted as a direct route and should provide additional amenities for holiday-makers from the Midlands to this popular resort.

A Question of Time

IT is such a pity (writes "A. Viator") that the rival merits of the new airport of Gatwick and of the old-established Airport of London, Croydon, have become the subject of some mild controversy. Since, however, various figures have been published in favour of Gatwick I am reluctantly compelled to take up the cudgels on Croydon's behalf.

The time-tables give the surface transport times as 40 min. by train from Victoria to Gatwick, and between 45 and 60 minutes (including formalities) by road from London to Croydon. It is really rather unfair, however, to assert that the flying time from Croydon to Le Bourget is 2¼ hr., whereas the time from Gatwick to Le Bourget is but 1 hr. 35 min. Everybody must know that the time of 2¼ hr. is the schedule of the big Imperial Airways' machines which do not pretend to great speed, but which give, instead, a luxurious service. What about the very conservative Air France schedule of 1 hr. 30 min., and Commercial Air Hire's 1 hr. 20 min.?

Returning to surface transport, it is a fact that there is a matter of 1 hr. 2 min. between the scheduled times of train and aircraft departure on the Paris services from Gatwick. Furthermore, the problem of arriving machines must be enough to break a traffic manager's heart—unless there are no winds at the new airport to bring machines in before or after time. Trains, like time and tide, wait for no man, whereas passenger coaches are there to await the convenience of air travellers. It would seem that when arriving at a rail-served aerodrome, you may have just missed a train and therefore must hang around for the next one. You may, of course, be lucky and just catch a train by means of a wild, troglodytic gallop along an echoing subway.

Taking things all round there is obviously no enormous advantage in flying from one airport or another, and if (as the prophet said) comparisons are odious, please remember I am merely defending Croydon and did not begin the battle!

Commercial Aviation

SINCE 1923

Finland Goes Ahead : Aerodromes or Abo and Helsingfors : Connections with Europe

TO the majority of people in this country the area comprising Finland, Esthonia, Latvia, Lithuania, and the northern part of the U.S.S.R. forms something of a geographical and historical blank. The few who have travelled in that part of Europe return with enthusiastic information, but the rest of us have certain vague ideas culled from such books as that of Walter Duranty.

It will, therefore, come as a surprise to a large number of people to learn that the Finnish air transport company, Aero O/Y, have been operating since 1923 and has gradually developed its connections with the rest of Europe, with the result that, in 1935, the company's machines carried 7,098 passengers and 139,266 kilograms of luggage, freight and mail, whilst the corresponding figures in 1924 were 534 and 4,094. The machines now used are three-engined Junkers Ju.52 seaplanes.

With the Swedish A.B. Aerotransport, Aero O/Y has been running the northern section of the "Scandinavian Air Express," from Tallinn (Reval), *via* Helsingfors and Abo, to Stockholm, with excellent connections at both ends. In July and August this year traffic will be intensified by yet another service leaving Helsingfors in the morning and connecting at Stockholm with the services to Central and Western Europe. The journey between Helsingfors and London can thus be made in one day in either direction. An interesting fact is, too, that from their inauguration, Aero O/Y has taken an active part in the international night mail service, and that the Finnish postal authorities have, since 1928, been sending all the European mail by air, and without extra charge.

Seaplane Services

Until now, Aero O/Y have had to work under somewhat extraordinary conditions. Apart from a few military aerodromes, there have been practically no landing fields in existence in the whole country. Fortunately, the whole coast of southern and western Finland, protected from wind and high waves by innumerable islands, made an ideal airport for the all-metal seaplanes with which the company started work across the Finnish Sea to Tallinn and over the Baltic Sea to Stockholm. Occasionally a machine was sent on an extended tour into the interior of the country in order to make demonstration flights at the provincial towns and market places with those who wanted to see their country from above. All these tours, which often lasted for months, were made, of course, with seaplanes, and "airports" were not difficult to find in this "Land of the Thousand Lakes" which, in reality, number 63,000—not counting the small ones!

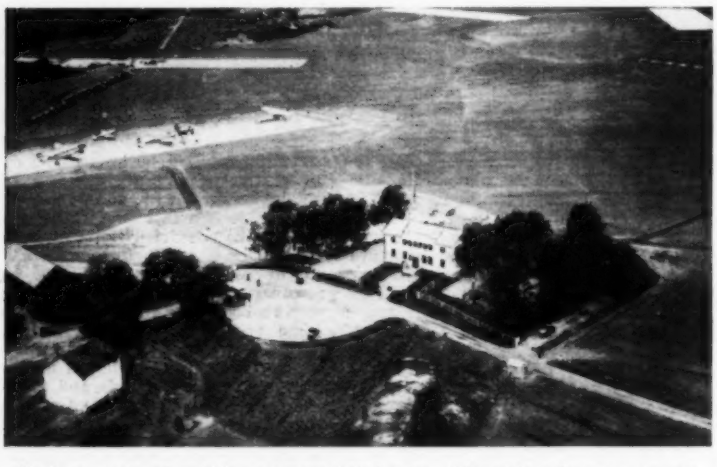
There is no lack of sheltered landing areas for seaplanes on the Finnish coast.

Warming Pans

In winter, the machines are fitted with wood and metal skis of special construction, designed by the Finnish Farnborough, and tested by the Air Force. These skis have proved to be especially useful on flights into the inner country, where the snow lies high, and even at the coast under similar conditions. If the ice is free from snow, however, it is found better to replace the skis with wheels. Another difficulty—when the temperature is often about 30 deg. C. below zero during a Finnish winter—was to get the engines started in the morning when the aeroplanes were standing on the ice some hundred yards from the shore. This has been assisted by the use of big "warming pans." In a really severe winter, it happens occasionally that the ice in the Finnish Sea cannot be forced by steamers and that the only means of communication between Finland and Esthonia is by the aeroplanes—which often, too, have to take provisions to ships which are imprisoned in the ice.

Though the cost of these "aerodromes" is at least low there has been one important drawback. In spring and autumn traffic has to be suspended for months, the water not being sufficiently free from ice to allow a safe landing on floats, and the ice, again, not being thick enough to carry the machines. For years, therefore, Aero O/Y have worked incessantly for the building of first-class landing fields at Helsingfors and Abo. These will make uninterrupted traffic possible during the whole year, since there is already a landing field in use at Tallinn and the new Bromma aerodrome at Stockholm was opened on May 23 of this year. As the authorities and public, too, began to realise the importance of good air communications the result was that the aerodrome at Turku (Abo) was ready to be opened in September, 1935, and the field at Helsingfors is expected to be ready in November of this year. This will mean an independence from all seasonal difficulties, as well as higher speeds and greater capacities through the replacement of the heavy floats by lighter land undercarriages.

Aero O/Y is in the happy condition of having no competition from surface transport other than steamers, and, considering the ever-increasing efficiency of the service, there is good hope of further satisfactory progress in the future.



Abo's new airport, which was opened last year. The prehensile runways are interesting, and among the machines on the left can be seen the D.L.H. Heinkel He. 111, an A.B.A. Northrop Delta, and Bristol Bulldogs of the Finnish Air Force.

HANWORTH ENTERTAINS

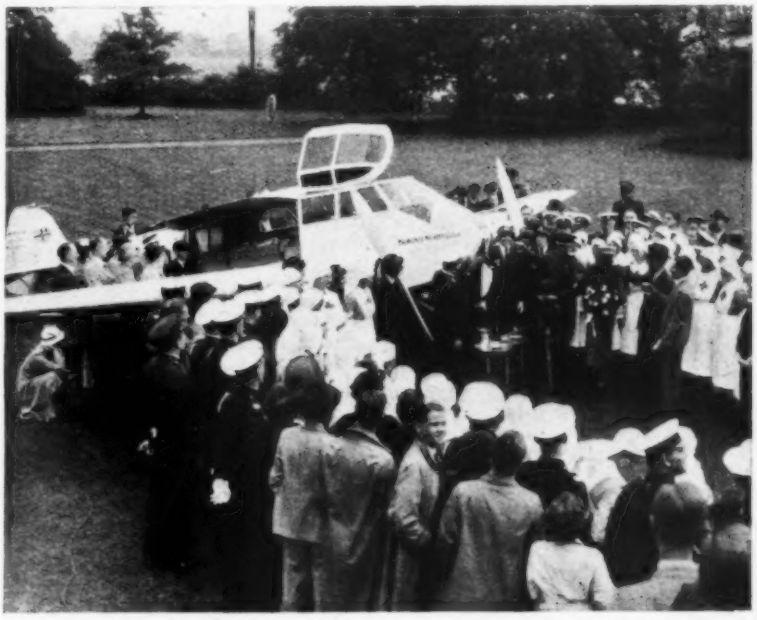
And an Air Ambulance is Presented

HANWORTH, last Sunday, held its annual Garden Party, the London Air Park Club, Aircraft Exchange and Mart, General Aircraft, and other concerns whose activities centre on this pleasant aerodrome, inviting a number of friends to an informal and entertaining little show.

The main feature of the proceedings was the christening of the Monospar S.T.25 ambulance, *Florence Nightingale*, by Mrs. Amy Mollison, in the presence of Col. E. M. Cowell, D.S.O., F.R.C.S., D.L., R.A.M.C., T.A. (county director of the British Red Cross Society, Surrey branch), and members of the Red Cross organisation. Mr. S. J. Noel-Brown, of General Aircraft, Ltd., who is Assistant County Director for Air to the Red Cross Society, was master of ceremonies. The first aeroplane to be built in this country specially for ambulance work, *Florence Nightingale* is a really beautiful machine, finished in dazzling white and bearing red crosses, and it looked at its best on Hanworth's green and pleasant lawns. The ceremony officially placed it at the complete disposal of the British Red Cross Society, who will use it for any urgent cases. Its employment is also expected to provide valuable data on the use of aircraft for ambulance work in the unhappy event of a national emergency.

A flying display followed, under the control of Mr. Pooley, of Aircraft Exchange and Mart. Mr. R. S. Munday started the ball rolling by floating round the sky with the B.A. Swallow in the characteristic manner of that machine, and F/O. Kirwan followed with the Aeronca, while F/O. Wilson gave a brilliant show with the Blackburn B.2 Trainer. Mr. S. L. Turner demonstrated the speed capabilities of the Cessna C.34, and F/O. J. H. Hill flew the Parnall Heck to good effect. Mr. Brie gave his now well-known exposition of the C.30 Autogiro's unique qualities, and Mr. Hordern aroused general admiration by a low-altitude display with the quiet-mannered Heston Phœnix. Flt. Lt. Schofield flew the big Monospar S.T.18, and Mr. Kronfeld gave his usual entertaining show with the Drone; he concluded by a hands-off landing. To do this, he has the Drone nicely trimmed and flies it on to the ground on a whiff of throttle, holding the stick between his knees. On this occasion, the fact—unknown to him—that he had punctured a tyre while crazy flying along the ground on one wheel did not seem to handicap his hands-off landing in the least.

The final item was a set piece, an "enemy aerodrome" being attacked with gas bombs by a Monospar. The victims, after having made certain that the gas bombs were well alight, lay down to die, while the aerodrome ambulance with gas-masked crew raced across to demonstrate the old way of handling this sort of thing. The new way was apparent when the Monospar ambulance made a most dashing arrival and was pulled up beautifully by Mr. Seth-Smith alongside the scene of carnage, Mr. Noel-Brown and a nurse alighting to administer oxygen and take the casualties aboard. Meanwhile, Mr. E. C. Gordon England sat up in the Monospar S.T.18 7,000 ft. or so above the battlefield, presumably as a League of Nations' referee to deal with the knotty problem of two opposing countries employing the same make of aircraft.



Mrs. Mollison christens the Monospar ambulance for the British Red Cross Society.

Another Multi-engine Mystery?

FIRST reports of the accident to the A./B. Aerotransport Fokker F.22 *Lappland* at Malmö last Tuesday state that all four engines stopped shortly after taking off. If this was the case, it seems surprising, as the fuel system of these machines was specially modified after the Schiphol accident last year.

Air Survey

Conference of Empire Survey Officers, 1935: Report of Proceedings. (His Majesty's Stationery Office, London, price £1.)

A NUMBER of the most important papers at last year's Conference of Empire Survey Officers dealt with air survey in its various aspects, with air photographs and with flying maps. The contributions included "Surveying Half a Continent—Canada," "Air Surveys and Instruments," "An Automatic Plotting Machine for Use with Air Photographs," "Aeronautical Maps," "Aviation Map of Malaya," and "Air Survey Technique in Canada." The volume should be a treasure for the student of surveying and should open the eyes of those who are not aware of the inestimable importance of the aeroplane in Empire development.

For Long-distance Navigation

AN interesting measuring chart, known as the Navicard, has been introduced into this country by Brown, Son and Ferguson, Ltd., of 52-58, Darnley St., Glasgow, S.1. This chart has been designed by a Hungarian, Mr. D. E. de Krausz, and is primarily intended for use in long-distance navigation over the sea, when only astronomical indications of position are available for obtaining latitude and longitude.

The instrument is ingenious in the way in which problems are solved, and certainly fulfils the claims of the designer up to a point. It is, however, difficult to work to fine limits with the chart in its present form, since the graticule is rather small. It is suggested that if the dimensions were increased by half the reading would be facilitated and the instrument would not be too cumbersome for its work. The magnifying glass, too, could be improved. It is difficult to read with the one at present supplied, even with very good light directly overhead, and the conditions in the navigating compartment of an aeroplane are not usually ideal.

With such modifications the Navicard would be useful for providing a quick check on logarithmic or slide rule calculations. Although, at the moment, the demand for such an instrument is limited, this demand will undoubtedly grow within the next year or two.

Private Flying

Topics of the Day

In Miniature

THOSE people who have seen the Tipsy S. in the air or on the ground must have been struck by its clean "big machine in miniature" appearance. Last week I shot about the sky in this tiny machine for a matter of half an hour, and I must say that its handling qualities by no means belie its appearance. It is not only a full-sized machine reduced in plain size but it is also pleasantly reduced (speaking almost metaphysically) in its handling qualities.

There is no other way in which its flying performance can be described. Everything happens as one would expect it to happen, but without conscious effort. In actual fact, it could be flown with the finger and thumb, and with a fiftieth of the available energy in one's legs.

One's first impressions might be described as those of one aboard an energised visiting card. Never have I felt so essentially part and parcel of a machine in my life. With the firm little wings spread out on either side I soon recovered from an initial sense of wonder and proceeded to treat it with rather less respect. Apart from the expected lightness and efficiency of the controls, there is nothing unusual about the machine in the air, and it simply asks to be flung about.

Explaining Performance

AS trimmed at present it is necessary to hold the lightest of forward pressures on the stick in order to fly level with a medium-weight pilot, and this has the amusing result that, once started in a steep turn, the Tipsy goes on turning by itself. Only in absolutely vertical turns is it necessary to apply a shade of elevator.

With an A.S.I. calibrated in kilometres and a very considerable position error at the pitot head, I brought it in on the fast side for the first time. Disregarding the error itself, a rough calculation suggested that the first approach was made at 60 m.p.h., and the long period of quiet hold-off necessary before all flying speed was lost showed me clearly how the 100 m.p.h. top speed (on 22 h.p. or so) had been obtained. The Tipsy is as clean as the proverbial whistle.

Glancing at the A.S.I. as the machine touched, finding that it registered a little less than 80 km/h., and remembering the slow speed at which the smooth turf of Fairey's aerodrome had been passing during the final stages of the hold-off, I realised the enormity of the position error.

Production machines will probably have the pitot head below the wing, and they will certainly have a sprung undercarriage. The prototype has a pair of widely spaced rigid legs, and the comparatively lengthy hold-off period is extremely useful for the purpose of placing the wheels of the machine, if possible, just one inch above the flying turf. I expected to do a good deal of "pump-handling" and surprised myself by placing the Tipsy firmly in position and holding it without further movement. There is nothing difficult about the landing if it is carried out with gentle movements, and the whole stall is so quietly innocuous that there should be ample time to cope with any minor errors of judgment.

The Sporting Single-seater

CURSED or blessed with a singularly adequate dash of caution, I felt hardly justified in giving way to a desire to aerobat the Tipsy on first acquaintance, but more than one pilot has already pushed it around the sky in a series of loops and rolls after a few minutes of experimental flying. Despite its small power, this little machine will do almost anything it is asked to do. I satisfied myself with vertical turns and some slow-speed experiments.

When fully stalled the Tipsy gently drops one wing or the other, but is under full control again almost before one has realised that the real stall has taken place. Turns were made with confidence at a speed which could not have been more than 5 m.p.h. higher than the minimum.

As in the case of many small machines, a full side-slip cannot be held without a considerable rise in velocity, but the machine can be "crabbed" very satisfactorily with full rudder and just enough aileron to prevent a turn.

There is practically no difference in attitude between normal level flight and the glide. At slower speeds the nose is naturally rather higher, but there is so very little of this that the range of view is not appreciably diminished. When cruising, this view is extraordinarily good, and the nose lies well below the horizon. In bad weather it would be possible to potter along on a breath of throttle, since the Douglas engine is very smooth throughout the range.

Incidentally, though the hold-off takes an appreciable time from a speed of 55 m.p.h. or so, the distance covered is comparatively small, and anything of a breeze would reduce both the time and the distance.

An Old Problem

WHICH reminds me of the ancient battle about down-wind turns and the like, involving similes about flies in express train carriages and rowing boats in strong tides.

My mind tells me quite clearly that an aeroplane is moving in a separate medium, and that the change of ground speed when a wind-gust dies down, or when a turn is made, can have no bearing on the performance of the machine so far as its air speed is concerned.

Experience tells me that when my machine flies into sheltered air, near a hangar, for instance, my gliding speed will drop suddenly, and that people have spun in off down-wind turns. Any sailplane expert will explain that when turning up-wind the nose can be hoicked up, but when turning down-wind the nose *must* be stuffed down.

Inertia must take the blame. INDICATOR.

FROM the CLUBS

Events and Activity at the Clubs and Schools

NORFOLK AND NORWICH

ALTHOUGH there was no Club flying last Tuesday and Wednesday, members compiled 34 hours during the remainder of the week. Mr. D. O. Moyniham and Mr. G. E. Greig have gone solo.

REDHILL

There were seven new members last week during which flying times amounted to 57 hr. 55 min. Mr. Nelson went solo and Mr. Slater passed his "A" licence tests.

R.A.F.

The Puss Moth has gone broad again, this time to the south of France with F/O. R. H. Harben, who proposes to take part in the Tour du Sud-est Aerien organised by the Aero-Club de Provence. F/O A. J. Stuart and P/O G. M. Lindeman have joined the Club.

C. A. S. C.

Members flew 11 hr. 45 min. during the week ending June 7. Mr. L. Allais passed his "A" licence tests. On Sunday eight members were on duty at Hanworth. Four of them assisted the British Red Cross Society in a demonstration of the new Monospar ambulance christened by Mrs. Mollison earlier in the afternoon.

BORDER

Minor accidents to club aircraft have reduced the Club's effective strength to one machine, yet flying times continue to increase. Over 100 hours were flown during May. Messrs. Porter and T. S. Robinson have passed their altitude tests. The Club operated the St. Bee's control for the recent Isle of Man air race and was congratulated on the efficient organisation.

HANWORTH

Club machines were used last week to co-operate with the army. Mr. John Kirwan returned from Stockholm last week in the Aeronca. Major Duncan and Messrs. A. Senanayeke and G. Hubbard became members and the tests for the "A" licence were passed by Messrs. V. Frizzoni, W. Beatty, L. Buchegger, and E. K. Portman-Dixon. Flying times last week totalled 71 hr. 45 min.

AERO-8

The Aero-8 Club, which at first confined its activities to the operation of Poux, now has a membership of 700, an extensive and improved aerodrome, more hangar accommodation, more machines, a larger staff and an improved clubhouse. The Club has obtained another flying school at Gravesend, where training for the "A" and "B" licence is available, it is claimed, at the lowest rates in the whole of England. During the early days of the Club the King, then Prince of Wales, expressed his interest and wished it every success. The Club flying ground at Canewdon is set in pleasant surroundings, and it is hoped that more members will come to camp near the aerodrome.

LIVERPOOL

During May 356 hr. 20 min. flying was recorded. The figure for the week ending June 6 was 65 hr. 40 min., a considerable increase over the corresponding figure for last year.

BRISTOL

The flying times for the weeks ending May 23 and May 30 respectively were 41 hr. 15 min. and 36 hr. 40 min. The total flying time for May was 200 hours, constituting a Club record for the month. Mr. R. Dyer has gone solo.

NORTH BRITISH

Steady progress has been made by the North British Aero Club since its reopening on April 1. Messrs. Stott, Bruce and Cargill are among the new members. On Empire Air Day the Club entertained several hundred guests.

MALLING

The Malling Aero Club flew 108 hr. 40 min. during May. First solos were made by Messrs. Bottomley and Procter and Messrs. C. H. Tutt, T. H. Green, A. W. Bolfield, H. G. Small and A. J. Ellman became members. Three Moths made formation flights to Redhill and Southend on Empire Air Day and Club machines did joy-riding at Eastchurch on the same occasion.

PERTH

The Strathtay Aero Club has just been formed to operate from the Perth Municipal Aerodrome at Scone. Thirty-nine pilot and 23 associate members have already been enrolled, the entrance fees being two guineas and one guinea and the annual subscriptions four guineas and one guinea respectively. An Avro Avian (Gipsy I) has been purchased, and it is hoped that the services of an instructor will be obtained at an early date. The flying rates will be £2 dual, and 30s. solo.

CINQUE PORTS

Considering the really bad weather experienced, the flying time for May, which totalled 267 hours, was quite satisfactory. Mrs. Macdonald has passed all her "B" licence tests with the exception of the cross-country and night flight. Mr. W. E. Davis, the managing director, has placed an order with General Aircraft for one of their new twin-rudder S.T.25 Monospars. When this machine is in service instruction will be available to those wishing to fly twin-engined machines. Mr. Guy Prendergast has bought a B.A. Swallow through the Club and in it has just returned from a flight to Stockholm. During May there were about 25 new members. Of these Mr. D. G. Walker has taken his "A" licence. The new offices, lecture room, lounge and control room which are being built will be ready late this month. Last week's flying time was 84 hours.

SCALED DOWN—BUT NOT IN PERFORMANCE: Flt. Lt. C. S. Staniland poses with the Tipsy S near the Great West aerodrome. "Indicator," on the previous page, describes some flying impressions when handling this delightful "baby" for the first time.

Private Flying

CAMBRIDGE

Flying times at Marshall's Flying School, The Cambridge Aero Club and the University Aero Club for the week ending June 6 totalled 141 hr. 15 min. Mr. Ewing passed his "A" licence tests, and Messrs. Smedley, Maas and Gerard joined the School.

LONDON

The flying times for the past two weeks were, respectively, 137 hr. 45 min. and 119 hr. 20 min. New members were Miss C. Butler, Messrs. F. Adams, C. J. K. Browne, E. A. Dymond, B. Kerr, K. H. Salusbury Hughes, and R. J. Courtney. Mr. H. J. Secker went solo.

WITNEY AND OXFORD

Of the 28 hours flying recorded last week, 11 represented solo flying. New members include Lord Allerton, Messrs. W. Westaby and J. E. Mansfield. Mr. R. G. Secretan has gone solo. Lord Allerton's B.A. Swallow and Mr. Duke Worilley's Cirrus-Moth are being housed with the Club. Mr. Appleby's Pou attracted large crowds over Whitsun. Mr. H. C. Russell, the wireless instructor, has taken his second-class navigator's licence.

LEICESTERSHIRE

The flying time logged by the Leicestershire Aero Club during May was 124 hr. 30 min. Mr. F. C. Campling has gone solo, and Mr. A. D. Phillips has qualified for his "A" licence. There was a "dawn patrol" to Grimsby on May 3, and another to Tollerton on May 31. The month's events included the visit of C. W. A. Scott's Air Display on the 2nd. Messrs. G. A. R. Muschamp and A. B. Crankshaw have become pilot members.

BRISTOL AND WESSEX

A shortage of machines and poor weather were responsible for the drop in flying time last week. The figure was actually 22 hr. 5 min. The fleet is now again at full strength. Miss Ferris and Messrs. N. A. Taylor, A. L. Mortimer and R. Walker have become members and Mr. D. Aslin has gone solo.

In face of bad weather, over 30 hours' flying was done during the week ending June 7. W. L. Cornelius passed the tests for his "A" licence.

YORKSHIRE

Club flying totalled 56 hr. 15 min. last week. The total for May was 253 hr. 25 min., and the corresponding figure last year was 230 hr. 45 min. Mr. and Mrs. P. W. Paine and Mr. D. Persse-Joynt have become members. Two German machines and a Monospar containing several Spanish visitors arrived on June 6 for the International meeting. A number of other machines were expected, but bad weather and French strikes delayed most of them. Low clouds and a gusty wind rendered Mr. Clem Sohn's display on June 3 impossible.

HERTS AND ESSEX

Adverse weather was responsible for a considerable decrease in the flying time for the fortnight ending June 4. Actually the figure was 136 hr. 32 min. First solos were made by Messrs. Phillips, Koch and Wherry. Messrs. Cather and Short completed the tests for the "A" licence. A Jubilee Monospar flown by Mr. Roger Frogley, with Messrs. Tyler, Ellis and Ercolani to complete the party, took off on May 25 for the "Whitsun in Austria" flight. New members are Miss P. J. Maffey, Messrs. R. F. Parkinson, A. Edwards, G. W. Foley, R. S. Walker, P. H. Whitney, H. Carson, J. E. Y. Le Moine, and R. C. Williams.

SOUTH COAST

Visitors next Saturday and Sunday to the International Meeting are reminded that the aerodrome will be closed from 2 p.m. to 6 p.m. The arrival competition, for which there is a £50 prize, is between 11.30 a.m. and 12.30 a.m. on Saturday. Those wishing to enter are requested to notify the secretary or Captain H. Duncan Davis, Brooklands Aviation, Ltd., Byfleet, Surrey. The dinner dance next Saturday at the Grand Hotel, Brighton, is open to the public. Visitors by air will be welcome to the dance at the club on Sunday night. New members include Mrs. Ward-Glenville and Messrs. Rostance, Gardner, Wright, Kohler, Price, Sawer and Spiller.

BROOKLANDS

Mr. Ken Waller gave an exhibition flight on his old Caudron at the B.A.R.C. meeting on Whit Monday. Sqn. Ldr. Hilton called in with his Envoy on Friday and dropped his engineer, Mr. Freddie Le Croy, after his recent trip from the Cape. Mr. W. Massey has returned from a nursing home where he underwent a successful operation. Three Club machines with pupils and instructors flew over to the opening of Gatwick Airport, where they joined in a formation flight with other clubs. Four machines took part in the "dawn patrol" to Reading on Sunday morning, although the weather was extremely bad. Capt. Max Findlay managed to win his usual free breakfast. A large party from the A.C. Sphinx Sparking Plug Co., of Dunstable, was shown over the school and workshops. Capt. Duncan Davis and several members flew up to Sywell for the opening of the new clubhouse. New members last week were Messrs. List, Andrews, Chesney and Bowater. Messrs. Boverie, Hunt and Heber-Percy went solo.

PORTSMOUTH

New members include Mrs. P. Morrison, Messrs. A. Hughes, H. R Llowarch, R. B. Priest, J. F. Carroll, F/O. B. R. Kerr, Flt. Lt. R Crosthwaite, Lt. J. A. Ivers, R.N., and Lt. G. C. Newcombe, R.N. Flying times for the week ending June 5 totalled 23 hours. Bad weather on three days accounted for this low figure.

YAPTON

Messrs. Holland, Clark, Corke and Jones took two club machines to Reading for the last "dawn patrol," and all were successful in obtaining free breakfasts. Flying times for May totalled 80 hr. 50 min. Miss Helen Crutchley and Mr. and Mrs. "Tommy" Rose, Mr. Bob Walker, Mr. John Croon, Mr. G. C. Matheson, and Flt. Lt. Frank Jones became members.

ABERDEEN

Hundreds of Aberdonians attended the aerodrome on Empire Air Day. A speech was given by Sir James Burnett of Leys on introduction by Mr. E. L. Gandar Dower. Flying times last week showed a marked increase over those for the previous week. Lord Pentland and Messrs. J. Stott, J. Harrington and J. Bruce have become members. The new offices adjoining the clubhouse are now occupied and the additions to the aerodrome are complete.

The Navigation Examinations

BETWEEN June 19 and July 2, inclusive, an examination for First Class Navigators' Licences will be held, provided that a sufficient number of applications are received. That for the Second Class will be held on June 29 and 30. Minor modifications have been made to the syllabus for the First Class examinations and applicants, who must write to the Secretary, Air Ministry (C.A.2), Adastral House, Kingsway, London, W.C.2, will receive a revised version.

Sywell Again

AFTER a considerable period of quiescence the Northamptonshire Aero Club came firmly into being again last Sunday. An impromptu garden party preceded and followed the official opening of the new and pleasing clubhouse by Flt. Lt. "Tommy" Rose, who was for some time an instructor at Sywell.

A surprisingly large number of private and demonstration machines put in an appearance before and after the ceremony—which was made as pleasantly unceremonious as possible—and the number of guests and spectators suggested that the new "Northamptonshire" will be even more popular than the old. As before, the club is associated with those at Brooklands and Lympne, and brothers Duncan and W. E. Davis were there to give the show the proper Brooklands-Cinque Ports atmosphere.

The new clubhouse actually forms a wing of the Reserve building, but is entirely separate and possesses all the usual amenities. For the moment the club has its own Gipsy Moth and a Tiger which has been temporarily loaned by the Brooklands Club. The rates are £2 an hour, dual and solo, and the instructor is Flt. Lt. H. P Wilson

Ancient and Modern

CONSIDERABLE extensions are being made to the hangar and workshops of the Warden Aviation Company, Old Warden aerodrome, near Biggleswade, in order to cope with the satisfactory amount of repair and experimental work which is being carried out there. At the moment the flying fleet consists of three Desoutters, a Moth and a Comper Swift

One of the Mark I Desoutters (actually that flown in two King's Cup races) is being rebuilt by Mr. Shuttleworth to take a Gipsy Major engine in such a way that the thrust line is as low as it originally was with the upright engine, and the effect, of course, will be to give the pilot an unusually good forward view For some unexplained reason, the Mark II machines, with the higher thrust line, never had the performance which might have been expected. Curiously enough, Mr. Shuttleworth's long-range Desoutter with a thick centre section tank is some five to ten miles an hour faster than its standard counterpart. The third machine is being used for some interesting experiments of which we may hear more in due course.

Meanwhile, the cross-channel Bleriot, described in *Flight* of November 7, 1935, is ready and may have been flown by now. It will be seen at the Hendon show and will probably be flown there by Mr. Shuttleworth, who has almost entirely recovered from the effects of his South African motor racing crash. This Bleriot, which is identical with that which Bleriot himself used, is the most beautiful piece of work, and, in fact, has one of the original fan type Anzani engines. A 1912 Deperdussin will be the next problem for Mr. Shuttleworth and his chief engineer, Mr. Jackson

HERE and THERE

News of Personalities and Developments in the World of Aviation

Mr. Lissant Beardmore

FLIGHT regrets to record the death, in a flying accident at Reading last week, of Mr. Lissant Beardmore, the Canadian-born opera singer who has taken a considerable part in aviation activities in this country during recent years.

Mr. Beardmore will be chiefly remembered for his pioneer glider flight across the Channel in June, 1931. Using a Professor sailplane, and towed to a height of 12,000ft. above Lympne by an Avro, he landed at St. Inglevert. Some trouble afterwards arose with the B.G.A. over the admissibility of the record, since the flight had not been made in the presence of an official observer.

Cape Record Attempt Abandoned

SQN. LDR. HILTON, who last week endeavoured to improve on Mrs. Mollison's Cape-London time, was delayed at Athens, and had to give up the attempt, though he continued to Croydon. He was flying an Airspeed Envoy fitted with Wolseley engines.

Big "Douze Heures" Entry

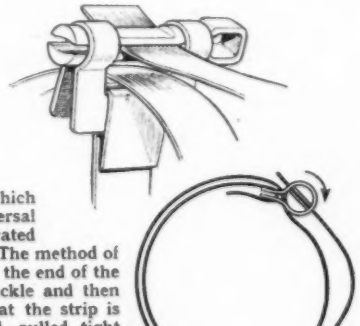
READERS will remember that a few weeks ago we referred to the annual French race known as the Douze Heures d'Angers, a rather unique event in which the competitors endeavour to cover the greatest possible distance in twelve hours; that they should complete as many laps as possible in this period is almost the only stipulation.

Although entries do not close until June 14, over fifty have been received. In the eight-litre class the majority of the machines are Caudron Rafales. In the four-litre class are three Comper Swifts flown by French pilots, and, among others, a machine of the Payen "flying wing" type.

The two-litre class has attracted the biggest entry of all, and among the competitors are several *Poux*, a Praga, and four Tipsy monoplanes. So far there does not appear to be any British entry.

R.A.F.'s New "Lifeboat"

A NOTEWORTHY new aircraft tender or rescue boat, designed for the Royal Air Force by Mr. Hubert Scott-Paine, has now successfully completed its trials. Measuring 64 ft. overall, it is the biggest craft of this type so far built by the British Power Boat Co., yet, since it is of the flat-bottomed type, its greatest draught (at the propellers) is only 3 ft. Fitted with three 500 h.p. Sea Lion engines (a special adaptation of the Napier Lion), the boat has a range of 800 miles at a speed of 28 knots. The boat was designed to a Royal Air Force specification which called for a top speed of 33 knots, and this figure, it is stated, has been handsomely exceeded. It is designed to carry a crew of eight and has stretcher provision for four casualties. Apart from ambulance duties, it is also well adapted to salvage work, and should not have any difficulty in taking large partially submerged aircraft in tow. Five watertight bulkheads render the craft practically unsinkable.



STRONG AND SIMPLE: Although radiator hose does not have such wide use on civil aircraft as was the case a few years ago, there are many uses to which the "F. and J." Universal Hose Clip, illustrated here, can be put. The method of operation is to pass the end of the strip through the buckle and then turn the pin so that the strip is wound upon it and pulled tight round the hose. The clip then remains locked and cannot possibly slip loose. The makers are Feeny and Johnson Ltd., 134/6, Ealing Road, Wembley, Middlesex.

British Interests in Spain

TWO members of a firm which represents a number of important British aircraft concerns in Spain are at present in London. The firm is Autocessorios Harry Walker, S.A., of Barcelona, and the two representatives are Mr. Harry Walker, the managing director, and Mr. E. Colomina, a director. Mr. Walker's address during his stay in London is the Constitutional Club, Northumberland Avenue, London, W.C.2.

The Lowe Wylde Fund

ON June 3 the Lowe Wylde Memorial Fund—to provide for the dependents of the late Mr. C. H. Lowe Wylde—had reached a total of £803, the latest list of donations being as follows:—

	£	s.	d.
T. O. M. Sopwith, Esq.	25	0	0
F. Sigrist, Esq.	25	0	0
Shell-Mex & B.P., Ltd.	5	5	0
Anglo-American Oil Co., Ltd. ...	5	5	0
C. O. Powis, Esq.	2	2	0
Sir Ernest and Lady Petter	2	2	0
A. C. Thornton, Esq.	2	2	0
A. E. Moss, Esq.	2	2	0
The Hon. Brian Lewis	2	2	0
Harold Whitehead, Esq.	1	1	0
L. E. Ledure, Esq.	1	1	0
Dr. Hackworth	1	1	0
Capt. D. R. Pobjoy	1	1	0
E. W. Percival, Esq.	1	1	0
R. H. Dobson, Esq.	1	1	0
J. D. North, Esq.	1	1	0
Mr. Palmer		10	6
Mr. Dunning		10	6
R. S. Dorward, Esq.		10	6
Mr. Little		10	0
Mr. Rube		5	0
Senior Staff of Vickers (Aviation) Ltd. Works	6	18	6
Anonymous	1	1	0
H. E. Broadsmith		10	6

Further donations are still urgently required, and should be sent to Mr. E. C. Gordon England at the London Air Park, Feltham, Middlesex.

Hawker-Siddeley Capital Increase

AT an extraordinary general meeting of the Hawker-Siddeley Aircraft Co., held last week in London, a resolution was considered increasing the capital of the company to £4,000,000 by the creation of 1,000,000 five per cent. cumulative preference shares of £1 each and of 4,000,000 ordinary shares of 5s. each.

Mr. T. O. M. Sopwith (chairman of the company), who presided, said that the directors had deemed it wise to equip the company with additional capital in view of the exigencies of the national aircraft emergency programme.

At the moment the group was employing 15,000 hands and large numbers of different types of aircraft were in course of production. A number of these types would be equipped with their own engines.

While it was not possible to estimate with any degree of accuracy the duration of the emergency period, it was prudent to assume that it would not be for more than a few years.

The Government's intention to limit profits was reasonable and proper provided that efficiency was encouraged by proper reward and that the question of plant, obsolescence and redundancy, which was inherent to the emergency programme, was suitably dealt with. It was also essential to the well-being of the industry and to the efficiency of the national defences that research should be energetically pursued, and adequate allowance for this expenditure should be made in production cost as a factor in determining profits.

When these open issues were effectively dealt with as between the Government and the industry, the necessary expansion on the extension of plant and machinery could be expedited.

They had also under consideration the immediate development of their business in foreign countries whose political interests were closely allied with our own, while the possibility of extension in British colonies and possessions also received their continued attention.

The resolution was carried unanimously.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

EXTENSIONS OF SERVICE

The undermentioned officers have been selected for retention on the active list as indicated:—

(i) GENERAL DUTIES BRANCH

(*a*) PERMANENT OFFICERS

To be retained to age 50

Wing Cdrs. Vernon Sydney Brown, Paul Bernard Hunter, Hugh Leedham, O.B.E., Alfred Samuel Morris, O.B.E. Sqn. Ldrs. Noel Parker Dixon, A.F.C., Bernard Edward Harrison, A.F.C., Flt. Lt. Robert Dawlas McEwan Hart.

To be retained to age 48

Sqn. Ldrs. John Reginald Cassidy, Jack Cottle, M.B.E., D.F.C., George Cecil Gardiner, D.S.O., D.F.C., Reginald Thomas Brooke Houghton, A.F.C., Thomas Standley Ivens, Alfred Price Maurice, D.F.C., Reginald James Sanceau, Richard Douglas Starley, M.C., Alfred Hugh Stradling, O.B.E., Victor Hubert Tait.

(*b*) OFFICERS RETAINED IN THE SERVICE TO COMPLETE TIME FOR RETIRED PAY

To be retained to age 55

Flt. Lts. William Badley, Frank William Foster, D.F.C., D.S.M., William George Kentfield.

(*c*) SHORT SERVICE OFFICERS—SERVICE TO BE EXTENDED TO COMPLETE SEVEN YEARS

Flt. Lts. Edward Reoch Berry, John Blackwell Sinclair Monypenny, Frederick Arthur Agar Hawker Strath, F/O. William John Craig.

(*d*) SHORT SERVICE OFFICER—SERVICE TO BE EXTENDED TO COMPLETE SIX YEARS

F/O. Rupert Vallings Bucknall.

(ii) STORES BRANCH

To be retained to age 48

Flt. Lts. Richard Thomas Rich, Albert Thomas Wells.

CENTRAL FLYING SCHOOL CATEGORIES

The undermentioned officers and airman pilots, who attended the Flying Instructors' Course at the Central Flying School from January 13 to March 28, have been categorised as follows:—

B

F/O.s P. E. Drew, F. S. Gardner, J. Grandy, M. B. Hamilton, W. J. Hickey, J. W. B. Judge, T. F. U. Lang, S. P. Langston, G. A. L. Manton, S. M. Moseley, P. H. S. Ross, F. W. C. Shute, E. A. Springall, A. W. Sweeny, L. F. J. Taylor, C. W. Williams, Sergts. Baker, P. J. F., Francis, E. H., Hayes, E. J., Holman, L. S., Howells, T. A., Jones, A. B., Masefield, E. B. G., Munns, A. C. L., O'Keefe, P. F., Noyes, L. B., Pickard, N., Ridd, B. C., Samuels, J. A., Scragg, C., Upton, D. A., Womphrey, E.

C

F/O.s J. F. Stephens, W. P. Sutcliffe, Sergts. Baker, D. E. P., Blake, A. S., Kirkham, W. A.

The undermentioned officer who attended a Flying Instructors' Course from September 16, 1935, to December 14, 1935, and from January 13, 1936, to February 9, 1936, has been granted category *B*:—

F/O. T. G. Lovell-Gregg.

AIR FORCE LIST

The June issue of the *Air Force List* has now been published. It can be purchased (price 3/-) from H.M. Stationery Office at the following addresses: Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh; 2, York Street, Manchester; ', St. Andrew's Crescent, Cardiff; 15, Donegall Square, Belfast; or hrough any bookseller.

TRANSFERS TO THE RESERVE

The undermentioned short service officers should note that they become due in October and November next for transfer to the reserve, or (where indicated) for relinquishment of commission, on completing their period of service on the active list:—

General Duties Branch

Flt. Lts. Roger Hargreaves Maw, Vincent George Govett, Paul Richard Joseph Leborgne, Charles Edward Stuart Lockett, Quentin Weston Aldridge Ross, Colin Campbell McMullen, Robert MacFarlan.

Flt. Lts. Ross and McMullen have been selected provisionally for permanent commissions.

Medical Branch

Flt. Lts. Carl Heustis Smith, M.D., C.M., Francis Ivan Gershom Tweedie, M.R.C.S., L.R.C.P., B.Ch.

Chaplains Branch

* The Revd. Cyril Damien Fay, * the Revd. Francis Graham Beauchant Sutherland.

* To relinquish commission, not liable for reserve service.

VACANCIES FOR APPRENTICE CLERKS

The Air Ministry announces that owing to the expansion of the Royal Air Force, an increased number of vacancies is offered to well-educated boys to enter as Apprentice Clerks. This career may appeal to many boys who are attracted to Service life and wish to travel abroad but have no liking for a mechanical trade.

The next entry will be made in July, and applications are to be received at the Air Ministry not later than July 1. Candidates must be in possession of an approved school certificate and must, on July 1, be between the ages of 15½ and 17½; preference will be given to those over 16.

Application forms and full information regarding the Apprentice Clerk scheme can be obtained from the Inspector of Recruiting, Royal Air Force, Victory House, Kingsway, London, W.C.2. Successful candidates will be required to complete twelve years' regular Air Force service after reaching the age of 18. At the age of 30 they return to civil life, but will normally be given an opportunity of entering the Royal Air Force Reserve and of drawing a gratuity of £100. A limited number may be permitted to re-engage to complete twenty-four years' service, qualifying for pension.

When a clerk has both attained the age of eighteen and successfully passed the examination at the end of his course the rate of pay is from 3s. to 4s. 6d. a day (21s. to 31s. 6d. a week) according to the degree of success achieved at the final examination. Subsequently there are opportunities for advancement with increased rates of pay. During the training period the Apprentice Clerk receives pay varying from 1s. to 1s. 6d. a day. In addition to pay, boys are provided with a free outfit, are lodged and victualled free of cost, and receive free medical attendance. They also have full opportunity to take part in the social and recreational activities of the units with which they are serving.

Apprentices normally receive eighteen months' training in clerical duties, typewriting, practical office routine, shorthand (for Clerks, General Duties), pay and store accounting (for Clerks, Accounting). Their general education will also be continued under a staff of graduate teachers.

FLYING ACCIDENTS

The Air Ministry regrets to announce that Lt. Cdr. John Wyatt Hale, Royal Navy, Flight Lieutenant, Royal Air Force, died in No. 3 General Hospital, San Stefano, on May 31, as the result of injuries received in an accident which occurred at Aboukir on May 22, 1936, to an aircraft of No. 447 (Fleet Spotter Reconnaissance) Flight, H.M.S. *London*.

Lt. Cdr. Hale was the pilot of the aircraft and Lt. John Bridgwater Kitcat, Royal Navy, who was not injured, was the passenger.

The Air Ministry regrets to announce that A/C.1. Frederick George Chalk lost his life and F/O. John Asher Sutherland was severely injured in an aircraft accident which occurred at Hal Far, Malta, on June 5. F./O. Sutherland was the pilot of the aircraft and A/C.1. Chalk the passenger.

F.O. J. A. Sutherland died in the Royal Naval Hospital, Malta, on the same day as the result of his injuries.

STRAITS SETTLEMENTS VOLUNTEER AIR FORCE

The first voluntary Air Force unit in the Empire, outside the United Kingdom, came into being at Singapore last week. Sqn. Ldr. C. H. Flinn, R.A.F., has been appointed to the command, and Flt. Lt. A. D. Grace is adjutant. The equipment consists of six Audax co-operation machines, two Tutors, and one dual-control Hart.

ROYAL AIR FORCE GAZETTE

London Gazette, April 2, 1936

General Duties Branch

The following Flight Lieutenants are granted permanent commissions in this rank (June 1):—D. J. Alvey, L. H. Anderson, R. G. C. Arnold, J. K. Brew, G. R. Canavan, R. Chadwick, H. F. Chester, R. A. Chignell, A. R. Collins, J. Constable-Roberts, J. Cox, P. D. Cracroft, A.F.C., K. B. B. Cross, R. S. Darbyshire, A. M. N. David, E. J. P. Davy, J. G. Elton, A.F.C., W. N. Elwy-Jones, R. F. Gandy, F. S. Gardner, E. J. George, T. P. Gleave, D. McC. Gordon, A. D. Grace, E. G. Granville, S. H. C. Gray, R. G. Harman, W. R. Hartwright, R. H. Hobbs, G. K. Horner, I. V. Hue-Williams, G. T. Jarman, R. L. Kippenberger, J. C. Larking, A. W. S. Matheson, H. W. Mermagen, G. R. Montgomery, H. Filling, W. A. Richardson, F. C. Seavill, S. E. R. Shepard, F. W. C. Shute, F. G. L. Smith, R. W. K. Stevens, A. W. Vincent, R. B. Wardman, P. W. M. Wright.

The following Airman Pilots are granted permanent commissions as Pilot Officers on probation with effect from and with seniority of May 21:—363929 Sgt. W. T. Dennis, 560751 Sgt. J. E. Dutton, 364120 Sgt. R. J. Kemsley, 363131 Flt. Sgt. S Lugg, 507767 Sgt. J. McLoughlin, 561203 Sgt. R. S. Mills, 561602 Sgt. A. Ovenden, 365580 Sgt. J. G. Priest, 364249 Sgt. E. N. Rooms, A.F.M., 365338 Sgt. F. L. Sayers, 363257 Sgt. C. E. Sims, 364176 Sgt. C. E. Slee, 366426 Sgt. R. W. Stewart.

The following are granted short service commissions as Acting Pilot Officers on probation with effect from and with seniority of May 18:—P. H. Alington, H. P. Blundell, J. W. H. Bray, W. M. H. Brookes, L. G. Burnand, P. A. Burnell-Phillips, S. A. Ellaby, J. Ellis, J. H. Giles, J. R. D. Hird, B. R. O'B. Hoare, D. E. Hughes, F. R. Jamieson, L. K. Keith, T. S. R. King (F/O., R.A.F.O.), F. F. Lambert, B. J. E. Lane, R. A. B. Learoyd, A. C. Leggate, P. H. Leyton, K. O. D. Lindsay, J. Martin, S. N. L. Maude, M. L. Morris, R. C. Porteous, K. C. Powell, I. B. N. Russell, L. H. Schwind, R. B. Smith, J. St. J. Thomson, C. R. B. Wigfall, J. B. Wray.

The following are granted temporary commissions as Flying Officers on attachment to the Royal Air Force (May 17):—Sub. Lts. R.N.—J. H. Barnes, A. R. H. Barton, G. W. L. A. Bayly, A. P. Boddam-Whetham, C. P. Campbell-Horsfall, E. W. Clifford, G. E. D. Finch-Noyes, A. S. Kennard, O. J. R. Nicolls, J. C. Reed, F. M. A. Torrens-Spence. Lt. R.M.—R. J. W. Nott.

The following are granted temporary commissions as Flying Officers on being seconded for duty with the Royal Air Force with effect from the dates stated:—Lt. D. C. Curme (Royal Artillery), Lt. J. K. M. Drysdale (The Royal Scots), Lt. G. P. L. Weston (The Middlesex Regt.) (May 18); Lt. J. F. Maffett (The Duke of Wellington's Regt.) (May 19).

Sqn. Ldr. N. P. Dixon, A.F.C., is seconded for service with the Egyptian Army Air Force (May 25); Pilot Officer on probation J. A. Tinne is confirmed in rank (March 15).

The following Flight-Lieutenants are promoted to the rank of Sqn. Ldr., with effect from June 1:—C. R. Smythe, R. R. Greenlaw, M.B.E., J. S. Nichol, J. B. Lynch, R. V. M. Odbert, E. S. Burns, E. J. Ffoulkes-Jones, W. E. Dipple, C. H. Brill, E. C. Barlow, E. S. Borthwick-Clarke, A. H. H. MacDonald, F. Woolley, O.B.E., D.F.C., W. A. D. Brook, M. Wiblin, J. H. Hargroves, S. J. Smetham, L. G. Nixon, N. H. D'Aeth, T. J. Desmond, R. H. S. Spaight, D. Macfadyen, C. B. R. Pelly, M.C., A. P. Revington, J. G. Hawtrey, R. Menzies, A. H. Love, G. H. Stainforth, A.F.C., F. R. D. Swain, A. G. Thackray, J. N. D. Anderson.

Lt. Cdr. R. A. Kilroy, R.N. Flt. Lt., R.A.F., ceases to be attached to the Royal Air Force on return to Naval duty (April 25); Wing Cdr. G. W. Robarts, M.C., is placed on the retired list at his own request (May 23); Lt. Cdr. R. H. S. Rodger, R.N., Flying Officer, R.A.F., relinquishes his temporary commission on return to Naval duty (January 17, 1934) (substituted for the notification in the *Gazette* of January 16, 1934).

Stores Branch

The following Flight Lieutenants are promoted to the rank of Squadron Leader, with effect from June 1:—J. J. Ironmonger, M.B.E., H. B. S. Ballantyne.

Accountant Branch

The following Flight Lieutenants are promoted to the rank of Squadron Leader, with effect from June 1:—W. E. V. Richards, C. W. Price.

Dental Branch

A. P. Britton, L.D.S., R.C.S., is granted a non-permanent commission as Flying Officer, with effect from May 4, and with seniority of January 29 (substituted for the notification in the *Gazette* of May 19).

Chaplains Branch

L. Wright is granted a short service commission with the relative rank of Squadron Leader, with effect from and with seniority of May 14.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

The following Flying Officers are promoted to the rank of Flight Lieutenant (May 12):—L. E. Vine, W. F. Murray.

The following Flying Officers are transferred from Class A to Class C with effect from the dates stated:—T. R. Wheatley (April 8); C. M. Willy (May 29).

Flt. Lt. W. E. P. Johnson, A.F.C., relinquishes his commission on completion of service and is permitted to retain his rank (May 8); F/O. T. S. R. King relinquishes his commission on appointment to a short service commission in the Royal Air Force (May 18); F.O. R. J. Parkhouse is removed from the Service (May 19).

Stores Branch

Flt. Lt. E. W. Simpson is promoted to the rank of Squadron Leader with effect from May 12.

The following Flying Officers are promoted to the rank of Flight Lieutenant with effect from May 12:—E. H. Broad, D. J. Divett, L. F. Caunter.

AUXILIARY AIR FORCE

General Duties Branch

No. 609 (WEST RIDING) (BOMBER) SQUADRON.—S. G. Beaumont is granted a commission as Pilot Officer (April 24).

No. 611 (WEST LANCASHIRE) (BOMBER) SQUADRON.—G. L. Pilkington is granted a commission as Squadron Leader and appointed to the command of the squadron (April 8).

Medical Branch

No. 609 (WEST RIDING) (BOMBER) SQUADRON.—T. McM. Boyle, M.B., Ch.B., M.R.C.S., L.R.C.P., is granted a commission as Flying Officer (April 24).

AUXILIARY AIR FORCE RESERVE OF OFFICERS

General Duties Branch

The Hon. H. C. H. Bathurst is granted a commission as Flight Lieutenant in Class A (May 1); C. D. Griffiths is granted a commission as Flying Officer in Class A (May 1).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leaders.—W. A. K. Dalzell, to R.A.F. Station, Kai Tak, Hong Kong; to command vice Wing Commander C. R. Keary, 24.3.36. R. Reay-Jones, to No. 3 (Indian) Wing Headquarters, Chaklala; for Air Staff duties, 16.4.36. H. L. Rough, D.F.C., to No. 9 (B) Squadron, Aldergrove; for flying duties, 23.5.36. J. F. Gordon, D.F.C., to No. 2 (Bomber) Group Headquarters, Abingdon; for Air Staff duties, 25.5.36.

Flight Lieutenants.—A. D. Isemonger, to Aircraft Depot, Karachi, India, 16.4.36. R. J. Twamley, to No. 31 (Army Co-operation) Squadron, Karachi, India, 9.4.36. J. V. Yonge, to No. 60 (B) Squadron, Kohat, India. W. H. Merton, to No. 38 (B) Squadron, Mildenhall, 25.5.36.

Flying Officers.—R. J. Knights-Whittome, to R.A.F. Station, Biggin Hill, 25.5.36. F. G. Mason, to No. 24 (C) Squadron, Hendon, 25.5.36. C. C. House, to Aircraft Depot, Karachi, India, 14.4.36.

Pilot Officers.—J. H. Slater, to No. 15 (B) Squadron, Abingdon, 25.5.36. W. E. Casley, to No. 38 (B) Squadron, Mildenhall, 24.5.36. K. C. Gill, to No. 215 (B) Squadron, Upper Heyford, 24.5.36. G. M. Lindeman, to No. 97 (B) Squadron, Boscombe Down, 24.5.36. A. J. F. Churchill, to Electrical and Wireless School, Cranwell, 24.5.36.

Acting Pilot Officers.—The undermentioned are posted to the R.A.F. Depot, Uxbridge, on appointment to short service commissions with effect from May 19, 1936:—P. H. Alington, H. P. Blundell, J. W. H. Bray, W. M. H. Brookes, L. G. Burnand, P. A. Burnell-Phillips, S. A. Ellaby, J. Ellis, J. H. Giles, J. R. D. Hird, B. R. O'B. Hoare, D. E. Hughes, F. R. Jamieson, L. K. Keith, T. S. R. King, F. F. Lambert, B. J. E. Lane, R. A. B. Learoyd, A. C. Leggate, P. H. Leyton, K. O. D. Lindsay, J. Martin, S. N. L. Maude, M. L. Morris, R. C. Porteous, K. C. Powell, I. B. N. Russell, L. H. Schwind, R. B. Smith, J. St. J. Thomson, C. R. B. Wigfall, and J. B. Wray.

Acting Pilot Officers.—J. H. L. Graham, G. M. Roddy, C. B. B. Wallis, to No. 55 (B) Squadron, Hinaidi, Iraq, 2.5.36.

Stores Branch

Flight Lieutenants.—R. G. A. Vallance, to No. 55 (B) Squadron, Hinaidi, Iraq, 19.4.36. T. A. Head, to No. 70 (B) Squadron, Hinaidi, Iraq, 19.4.36.

Flying Officers.—R. C. V. Ash, to Supplies and Transport Services, Iraq, 23.5.36. J. R. Fraser, to No. 1 (Indian Wing) Station, Kohat, 7.4.36.

Accountant Branch

Flying Officer.—R. F. L. Hart, to No. 84 (B) Squadron, Shaibah, Iraq, 23.4.36.

THE INDUSTRY

Titanine Reorganisation

TITANINE, LTD., announce that they have taken over the assets and liabilities of Titanine-Emaillite, Ltd., the well-known dope manufacturers, including the full benefit of all contracts and engagements. The business will be carried on in the same manner as before, and under the same management.

Still Growing

THREE times during the last ten years B.E.N. Patents, Ltd., of Park Royal, London, N.W.10, makers of spray-painting equipment, have had to move into larger premises; now still further expansion has necessitated the erection of a two-storey extension to accommodate administrative offices, drawing office, experimental department and demonstration room.

Homing Equipment Instructions

USERS of the R.T.E. homing equipment (R.C.34B) will find much useful information in an instruction booklet which has just been issued in a handy and well-bound form for carrying on board an aircraft. It is now being supplied with this equipment, and extra copies are obtainable from Radio Transmission Equipment, Ltd., 111, Charing Cross Road, London, W.C.2.

British Aluminium at Bristol

IT is announced that the British Aluminium Co., Ltd., has opened a branch office and warehouse at Rose Street, Temple, Bristol, 1 (Telephone 21747), under the management of Mr. O. Halliwell.

At this warehouse the company will hold stocks of its standard products, i.e., aluminium and its alloys in crude and semi-manufactured forms, including ingots, notched bars, sheets, tubes, and sections.

Marconi Extension

AT the recent annual general meeting of Marconi's Wireless Telegraph Co., Ltd., it was stated that since the beginning of the year the company had been almost overwhelmed by a rush of orders unprecedented in its history, so much so that the works at Chelmsford had had to be considerably extended. Some of the new buildings are already in use, and the extensions will be completed by the end of the summer at a cost of more than £50,000.

About Dowty's

A VERY fine catalogue, covering the whole range of Dowty equipment, has been produced by Aircraft Components, Ltd., of Arle Court, Cheltenham. Complete with photographs and fully dimensioned drawings, it covers such items as retractable undercarriages, oleo-pneumatic shock-absorbers, internally sprung wheels, fixed and retracting tail wheels, hydraulic-operating systems for undercarriages and flaps, electrical and engine-driven hydraulic pumps, flap and undercarriage indicators, and control latches.

Short Bros. Capital Increase

AT an extraordinary general meeting of Short Bros. (Rochester and Bedford), Ltd., held recently, a resolution increasing the capital to £250,000, by the creation of 400,000 ordinary shares of 5s. each, was proposed. Mr. H. Oswald Short, the chairman, explained to the shareholders recent developments in regard to the Belfast factory of Harland and Wolff (referred to in the June 4 issue of *Flight*), and the resolution was seconded and carried unanimously.

The formation was announced last week of Short and Harland, Ltd., the new company in the organisation which Harland and Wolff and Short Brothers are co-operating. The company has a capital of £450,000 in £1 shares. The directors are Mr. Oswald Short, Mr. H. P. Harland, Mr. F. E. Rebbeck, Mr. Arthur Gouge, and Mr. J. H. Wood.

Vokes' Reorganisation

PARTICULARS were published in London last week "for information only," regarding Vokes, Ltd., a company which has been formed, with a capital of £50,000 in 2s. shares, to take over the established business of C. G. Vokes, Ltd., of Putney, the well-known makers of aircraft and other silencers, and air and oil filters.

A Steel Appointment

IT is announced that Mr. G. Ernest Wells, until recently a director of Edgar Allen and Co., Ltd., Sheffield, has now joined the Board of Kryn and Lahy (1928), Ltd., engineers and steel founders, of Letchworth, Herts.

Mr. Wells' connection with Edgar Allen's dates from 1900, and for seventeen years he was a director occupying also the position of foundry manager. Amongst his many activities Mr. Wells was responsible for the design of the entire foundry and its equipment.

During the War Mr. Wells acted as controller of the whole of the iron and steel foundries in Great Britain on behalf of the Ministry of Munitions.

Alvis and Aero Engines

AT the annual general meeting of the Alvis Car and Engineering Co., Ltd., held last Monday in Coventry, Mr. T. G. John (chairman and managing director) said that the company's decision to manufacture aero engines, taken long before the defence programme came into being, had now been amply justified.

They already had two distinct achievements to their credit—firstly, that within five months of placing the contract for the large aero engine factory work on aero engines was being actively carried out; and secondly, that they hoped to have on test in the very near future the most powerful aero engine yet manufactured.

Developments of that magnitude required extensive experimental work, much patience, a sound judgment and a considerable amount of finance. He believed that with the increase of capital which the shareholders would be asked to authorise at the extraordinary general meeting to be held on June 22 they had all the essential requirements for that purpose.

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

A.O.C. TRUST, LTD., was registered as a private company on June 3, with a nominal capital of £1,750 in 1/- shares. Objects: to invest the capital and other moneys of the company in the purchase of shares of Aircraft Operating Co., Ltd., of Aircraft Operating Co. of Africa (Proprietary) Ltd., or the shares, etc., of any other company, and to carry on the business of an investment trust company. First directors to be appointed by the subscribers. Solicitors: E. F. Turner and Sons, 115, Leadenhall Street, London, E.C.

ULSTER GLIDING CLUB, LTD. Private company, registered in Belfast May 28. Capital, £100 in £1 shares. Objects: to promote gliding, soaring and aerial navigation in all its forms. Directors: Mrs. Kathleen I. Mackie, Marcus Barnetts Road, Belfast; William Liddell, 44, Upper Queen Street, Belfast. Secretary: Norman P. Metcalfe. Registered Office: Downhill Hotel, Downhill, Co. Derry.

AER LINGUS, TEORANTA, was registered in Dublin as a private company on May 22, with a nominal capital of £100,000 in £1 shares. Objects: to foster the pursuit of aviation in all its forms; to operate aerial transport in Ireland and elsewhere. The subscribers are: Sean O'Madhaigh, 12, Dawson Street, Dublin, H.M. solicitor; Thomas J. Flynn, 14, Stephens Green, Dublin, civil servant. The first directors are not named.

VOKES, LTD., was registered as a public company on May 27 with a nominal capital of £50,000 in 2s. shares. Objects: to acquire the undertaking of C. G. Vokes, Ltd. (incorporated in 1929), and to carry on the business of manufacturers of air and oil filters and silencers for motor and aircraft engines, and aircraft, motor and industrial accessories. First directors to be appointed by the subscribers. Solicitors: J. D. Langton and Passmore, 16, Tokenhouse Yard, London, E.C.

INCREASES OF CAPITAL

PORTSMOUTH, SOUTHSEA AND ISLE OF WIGHT AVIATION, LTD. (165, High Street, Ryde, I.O.W.).—The nominal capital has been increased by the addition of £7,500 beyond the registered capital of £22,500. The additional capital is divided into 15,000 redeemable preference shares of 10s. each.

CHANGES OF NAME

B.A.C. (1935) LTD. (Victoria Road, Feltham, Mdx.)—Name changed to Krouse, Ltd., on May 21, 1936.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.).

(Published June 11, 1936).

31973. RUBBRA, A. A.: Controls for superchargers on aircraft (447,324).
32339. COATS, A. G., and HAFNER, R.: Rotating-wing aircraft (447,066).
32569. HEIN, H.: Arrangement for supporting and operating an aircraft sail (447,133).
32652. IMPERIAL AIRWAYS, LTD., and BURCHALL, H.: Adjustable chairs (447,320).
32898. ELLOR, J. E.: Cowling for liquid-cooled internal-combustion engines of aircraft (447,283).
2962. FARMER, G. H.: Carburetters for aircraft (447,301).
3554. FARMER, G. H.: Carburetters for aircraft (447,218).